**MATHEMATICS (IX CLASS)**

**SURDS**

1. Like surds among the following [ ]

   A) $2\sqrt{3}, 2\sqrt{5}$ B) $\sqrt[3]{5}, \sqrt{7}$ C) $\sqrt[4]{5}, \sqrt[5]{9}$ D) None

2. $\sqrt{60}$ is same as [ ]

   A) $2\sqrt{15}$ B) $15\sqrt{2}$ C) $2\sqrt{30}$ D) None

3. Pure form of $5\sqrt{2}$ is [ ]

   A) $\sqrt{125}$ B) $4\sqrt{5}$ C) $10\sqrt{2}$ D) None

4. Conjugate surd of $a+\sqrt{5}$ is [ ]

   A) $a-\sqrt{5}$ B) $a\sqrt{5}$ C) $a+\sqrt{5}$ D) None

5. Surds in the form of $\sqrt{a}$ are called [ ]

   A) Mixed B) Pure C) Binomial D) None

6. If $a=\sqrt[3]{5}$ and $b=\sqrt[4]{3}$ then [ ]

   A) $a > b$ B) $a < b$ C) $a = 0$ D) None

7. $\sqrt[5]{2^5}$ is a surd [ ]

   A) True B) False C) Can't be decided D) None

8. If $a=\sqrt[3]{5}$ then $\sqrt[3]{5^2}$ is called it is [ ]

   A) RF B) compliment C) Supplement D) Conjugate

9. The smallest multiple of $2\sqrt{5}$ is [ ]

   A) $2\sqrt{5}$ B) $5\sqrt{5}$ C) $\sqrt{5}$ D) $10\sqrt{5}$

10. Which of the following is a mixed surd [ ]

    A) $5\sqrt{6}$ B) $\sqrt[6]{5}$ C) $\sqrt[3]{5}$ D) $\sqrt[6]{9}$

11. All irrationals are surds. The counter example is [ ]

    A) $\pi$ B) $\frac{22}{7}$ C) 0 D) None

12. $\sqrt[m]{\sqrt[n]{a}} = \sqrt[n]{\sqrt[m]{a}} =$ [ ]

    A) $a^{m+n}$ B) $\sqrt[mn]{a}$ C) $\frac{1}{a^{mn}}$ D) $a^{mn}$

13. The product of any two conjugate surd is always [ ]

A) Rational B) Irrational C) Imaginary D) None

14. The R.F of $2^{\frac{1}{3}}$ is [ ]

A) $2^{2/3}$ B) $2^{1/3}$ C) $2^{3/2}$ D) 2

15. A surd of order 3 is called [ ]

A) Cubic B) Quadratic C) Biquadratic D) None

16. The product of $\sqrt[3]{2} \times \sqrt[4]{3}$ is [ ]

A) $\sqrt[12]{432}$ B) $\sqrt[12]{324}$ C) $\sqrt[12]{6}$ D) None

17. If $\frac{\sqrt{2+1}}{\sqrt{2-1}}$ = a+b $\sqrt{2}$ then the value of b is [ ]

A) 2 B) 3 C) 4 D) 9

18. In $\sqrt[n]{a}$ if $a = x^n$ then $\sqrt[n]{a}$ becomes an [ ]

A) Imaginary B) Irrational C) Rational D) None

19. Simplified form of $\sqrt{32} \times \sqrt[3]{8} \times \sqrt{68}$ is [ ]

A) $\sqrt{1692}$ B) $8\sqrt{43}$ C) $8\sqrt{34}$ D) None

20. The exponential form of $\sqrt[3]{5\frac{2}{4}}$ is [ ]

A) $5^{\frac{1}{6}}$ B) $5^6$ C) $5^{\frac{6}{4}}$ D) None

21. The RF of $1+\sqrt{5}$ is [ ]

A) $\sqrt{5}$ B) $1-\sqrt{5}$ C) $\sqrt{5}-1$ D) None

22. The value of $\left(\sqrt{2}\right)^2 - 5^2$ is [ ]

A) -23 B) -3 C) -1 D) -25

23. $\sqrt[n]{a} + \sqrt[n]{b}$ = [ ]

A) $\sqrt[n]{ab}$ B) $\sqrt[n]{a+b}$ C) $\sqrt[n]{a-b}$ D) None

24. R.F of $\sqrt[3]{5} + \sqrt[3]{\frac{1}{5}}$ is [ ]

A) $\sqrt[3]{5}-\sqrt[3]{\frac{1}{5}}$ B) $\sqrt[3]{25}-\sqrt[3]{\frac{1}{25}}$ C) $\sqrt[3]{25}+\sqrt[3]{\frac{1}{25}}$ D) None

25. Rationalising factor of $2\sqrt{3}$ is [ ]

A) $\sqrt{3}$ B) $\sqrt[2]{5}$ C) $\sqrt[4]{9}$ D) $\sqrt[3]{5}$

**SETS**

26. The set theory was proposed by [ ]

A) Thales B) Euclid C) Cantor D) Ramanujam

27. The set is the collection of well defined [ ]

A) Sets B) Objects C) Letters D) None

28. A set with no element in it is a

A) void set B) full set C) empty D) infinite

29. Q set is an example of [ ]

A) Finite B) infinite C) empty D) disjoint

30. If n(A)=n(B) then, A and B sets are [ ]

A) equal B) equivalent C) proper D) disjoint

31. A and B sets are [ ]

A) disjoint B) over lapping C) infinite D) none

32. The collection of all the natural numbers less than 0 is [ ]

A) none B) infinite C) empty D) finite

33. If $\overline{AB}$ and $\overline{CD}$ are two parallel lines, then $\overline{AB} \cap \overline{CD}$= [ ]

A) AB B) B C) A D) $\varnothing$

34. Two sets having no elements in common are called [ ]

A) empty B) sub sets C) over lapping D) disjoint

35. (A-B)U(B-A)= [ ]

A) $\varnothing$ B) A C) B D) none

36. $|A|+|B|-|A\cap B|=$ [ ]

A) $|A\cup B|$ B) $|A\cap B|$ C) $|A-B|$ D) AxB

37. The list form of $\{x/x\in N \text{ and } x>10\}$ is [ ]

A) $\{10,11,12,...\}$ B) $\{11,12,...\}$ C) $\{10,9,8...\}$ D) $\{,11,10,9...\}$

38. Number of sub sets of $A=\{1,2,3\}$ is [ ]

A) 3 B) 2 C) 8 D) 16

39. A set has n elements in it. Number of proper sub sets is [ ]

A) $2^n$-1 B) $2^{n-1}$ C) 2n-1 D) $(2^n)^{-1}$

40. Which of relation given holds good? [ ]

A) $N \subset W$ B) $W \supset Q$ C) R=Q D) None

41. $|A \cap B| = |B \cap A|$ [ ]

A) true B) false C) both A & B D) none

42. The set which is sub set of every set is [ ]

A) empty B) N C) W D) None

43. If $A \subset B, B \subset C$ then, $A \subset C$. This property is known as [ ]

A) reflexive B) commutative C) trichotamy D) transitive

44. Which of the following is a wrong one ? [ ]

A) $A \cup B = B \cup A$ B) $A \cap B = B \cap A$ C) A-B =B-A D) AxB=BxA

45. Which of the following represent $\{x / x \in A \text{ and } x \in B\}$ ? [ ]

A) $A \cup B$ B) $A \cap B$ C) A-B D) AxB

46. Correct among the following [ ]

A) $AUB = |A \cup B|$ B) $A \cap B = B \cap A$ C) AxB=BxA D) A-B=B-A

47. Given that $T = \{O, \square, \Delta, \varnothing, 10\}$. Correct among the following. [ ]

A) $O \subset T$ B) $\square = T$ C) $\varnothing \notin T$ D) $10 \in T$

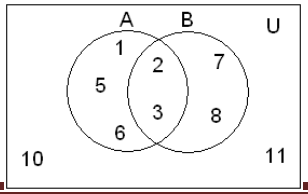
48. Given that $T = \{O, \square, \Delta, \varnothing, 10\}$. false among the following. [ ]

A) T=T B) $T \subset T$ C) $\varnothing \subset T$ D) $\Delta \subset T$

49. Given that $T = \{O, \square, \Delta, \varnothing, 10\}$. Cardinal number of T is [ ]

A) 6 B) 5 C) 4 D) 3

Answer the following from the given diagram.



50. n(A)+n(B)- $n(A \cap B)$= [ ]

A) 3 B) 5 C) 7 D) none

## RELATIONS

51. If(x,-3) = (-4, y) then the values of x and y are [ ]

A) x =-3 ; y = -4 B) x=-4 ; y =-3 C) x=3 ; y =4 D) x=-4 ; y=3

52. If A = {1, 2, 3}, then the number of elements in A x A [ ]

A) 9 B) 6 C) 8 D) 3

53. Which of the following relations is an equivalence relation ? [ ]

A) Every triangle is congruent to itself B) ' < ' relation in natural numbers

C) '$\perp$' in a set of lines in a plane C) '$\subseteq$ ' (the relation subset)

54. Example for an ordered pair [ ]

A) {2, 3} B) {(2, 3)} C) (2, 3) D) (2)

55. (x+y,1) = (5, x-y) then x= [ ]

A) 6 B) 3 C) 2 D) 4

56. A = {2, 1} ; B = { 0 } then A x B = [ ]

A) {(2, 0), (1, 0)} B) {(0,2), (0,1)} C) {(2, 0), (0,1)} D) $\Phi$

57. A, B are two non empty sets if A x B = B x A $\Rightarrow$ [ ]

A) A = B B) A $\neq$ B C) $A \subset B$ D) $B \subset A$

58. $A \subset C$ ; $B \subset D$ $\Rightarrow$ [ ]

A) (A x B) $\subset$ (C x D) B) (A x C) $\subset$ (B x D)

C) (C x D) $\subset$ (A x B) D) (A x D) $\subset$ (B x C)

59. R = { (1, a), (2, b), (3, c) } Domain of R = [ ]

A) {a, b, c} B) {1, a, 2, b, 3, c} C) {1, 2, 3, a) D) {1, 2, 3}

60. The inverse relation to x > y is [ ]

A) y □ x B) x □ x C) x < y D) y > x

61. Which of the following is an equivalence relation ? [ ]

A) is parallel to B) is a factor of C) is greater than D) is perpendicular to

62. n(A) = 3 ; n (B) = 4 ; then n (A x B) = [ ]

A) 7 B) 12 C) 24 D) 1

63. Which of the following is a function = [ ]

A) {(1,2), (2,3), (2,4)} B) {(1,2), (2,2), (3,2)}

C) {(1,4), (1,5), (1,6)} D) {(2,3), (3,2), (2,4)}

64. If R= {(2,4), (3,9), (4,16), (5,25)} then the range of $R^{-1}$ [ ]

A) {2, 3, 4, 5} B) {4, 9,16, 25}

C) {25, 16, 9, 4} D) {2, 3, 4, 5, 9, 16, 25}

65. A = {1, 2, 3} ; B = Φ then (A x B) = [ ]

A) {1, 2, 3,Φ) B) Φ C) {1, 2, 3} D) { Φ }

66. R = {(a, $a^2$), (b, $b^2$), (c, $c^2$)} Range of R = [ ]

A) {a, b, c} B) {$a^2$, b, $c^2$}C) {$a^3$, $b^3$, $c^3$} D) {$a^2$, $b^2$, $c^2$}

67. A = {2, 3, 4} ; B = {3, 4} ; C = {2} (A-B) x C = [ ]

A) {(2, 3), (2, 2), (4, 2)} B) {(3, 2), (4, 2)}

C) {(2, 2)} D) {(2, 2), (3,2), (4, 2)}

68. A = {1, 2, 3} ; The relation ' R ' is reflexive in A ; So R = [ ]

A) {(1, 2), (2,3), (3,1)} B) {(1, 2), (1,3), (2,3)}

C) {(1, 1), (2,2), (3,3)} D) {(3, 2), (2,1), (3,1)}

69. (x, y) ∈ R ⇒ ..... ∈ $R^{-1}$ [ ]

A) (y, x) B) (x, y) C) (x, x) D) (y, y)

70. R = {(1, 1), (2,4), (3,9)}, Set builder form of the above relation [ ]

A) R = {(x, y) / $x=y^2$} B) R = {(x, y) / x=y+2}

C) R = {(x, y) / $x^2=y$} D) R = {(x, y) / $x^2=y^2$}

71. n (A x B) = 10 ; n (A) = 5, So n(B) = [ ]

A) 5 B) 2 C) 10 D) 1

72. n (A) = 3, n (B) = 2, then no. of relations from A to B is [ ]

A) 8 B) 9 C) 64 D) 63

73. n (A) = 3, n (B) = 2, then, no. of functions from A to B is [ ]

A) 8 B) 9 C) 6 D) 5

74. n (A) = 3, n (B) = 2, then no. of injections from A to B is [ ]

A) 8 B) 6 C) 5 D) 0

75. n (A) = 3, n (B) = 2, then no. of surjections from A to B is [ ]

A) 8 B) 6 C) 5 D) 0

## POLYNOMIALS AND FACTORISATION

76. One of the factor of $x^4+2x^3-13x^2-14x+2^4$ is [ ]

A) (x+1) B) (x-1) C) (x+2) D) None

77. One of the root of the equation $ax^2+bx+c = 0$ is [ ]

A) $\frac{-b+\sqrt{b^2-4ac}}{2a}$ B) $\frac{-b+\sqrt{b^2\times 4ac}}{2a}$ C) $\frac{-a+\sqrt{b^2-4ac}}{2a}$ D) $\frac{b^2-4ac}{2a}$

78. The value of $x^6-19x^5+69x^4-151x^3+22ax^2+6x+9$ when x = 1 by Honner's method is [ ]

A) 51 B) 65 C) -180 D) None

79. The Remainder when $10x^2-15x+17-18x^3$ is divided by x – 8 by Reminder theorem [ ]

A) 1215 B) -1161 C) 315 D) None

80. If $\alpha$ and B are the roots of the equation $ax^2 + bx + c = 0$ then $\alpha$+B =

A) $\frac{-b}{a}$ B) $\frac{c}{a}$ C) $\frac{-c}{a}$ D) None

81. $P(x) = x^2+6x+12$ is a multiple of (x-2) because [ ]

A) P (2) = 0 B) P (-2) = 0 C) P(0) = 0 D) None

82. If 2x + y = 11 and 2x - 2y = 8 then (x, y) = [ ]

A) (2, 3) B) (3, 2) C) (0, 1) D) None

83. 5x + 5y = 25 and x+y = 5 are the examples of ..... equations

A) Independent B) dependent C) Inconsistent D) None

84. Number of solutions for inconsistent equations [ ]

A) 0 B) 1 C) infinite D) None

85. The sum of two number is 50 and their difference is 10. The order pair which satisfy the equations is [ ]

A) (10, 50) B) (50, 10) C) (30, 20) D) (20, 30)

86. The equations in the form of $ax^2+bx+c$ are called [ ]

A) Quadratic B) Simple C) Liner D) Cubic

87. $x^2 = 16$ can be written in the form of $ax^2 + bx + c = 0$ and hence have 2 roots $\alpha$ & $\beta$ [ ]

A) Yes B) No C) Can't be decided D) None

88. The sum of 3 consecutive even numbers is 156. The largest number is

A) 52 B) 54 C) 50 D) none

89. In a two digit number, the units digit is twice ten's digit. The sum of the digits is ¼ of the whole number. The whole number is [ ]

A) 84 B) 48 C) 42 D) 24

90. If $\frac{x+4}{5} - \frac{2x+10}{10} = 2(x+2)$ *then* $x =$ [ ]

A) 128 B) -114 C) imaginary D) None

91. The process expressing an expression as the product of two or more than two expressions is called [ ]

A) Factorisation B) Transposition C) Super position D) None

92. The factorization is the reverse process of [ ]

A) Addition B) Subtraction C) Multiplication D) Division

93. If a trinomial is a perfect square then it must be the square of a [ ]

A) Tetranomial B) Monomial C) Trinomial D) Binomial

94. $\sqrt{-\left(a^2-2ab-b^2\right)} =$ [ ]

A) (a + b) B) (a – b) C) ab D) None

95. Number of factor does $x^2 - y^2$ have? [ ]

A) 4 B) 3 C) 2 D) 1

96. Factors of $\pi R^2 - \pi r^2$ are [ ]

A) $\pi(R+r)^2$ B) $\pi(R+r)(R-r)$ C) $\pi(R-r^2)$ D) None

97. What should be multiplied with $(a^2 + 2ab + b^2)$ to get $a^3+b^3$ ? [ ]

A) a + b B) a - b C) $a^2 - 2ab + b^2$ D) None

98. The value of $\frac{51^2 - 49^2}{51 - 49}$ *is* [ ]

A) 2496 B) 100 C) 2 D) None

99. If a + b = 10, ab = 5 then $(a + b)^3$ = [ ]

A) 150 B) 2131 C) 65 D) None

100. If a + b + c = 0 then $a^3 + b^3 + c^3$ = [ ]

A) 3 B) 3 abc C) 0 D) None

## LINEAR EQUATIONS AND INEQUATIONS

101. The mathematician who has represented the ordered pair in a plane is

A) Euclid B) Ronald C) Canter D) R.D Carter

102. The abscissa of (x, y) is [ ]

A) x B) y C) 1 D) xy

103. The ordinate of –(-3, 4) is [ ]

A) -3 B) 4 C) 3 D) -4

104. x co-ordinate is the distance from a point (x, y) to [ ]

A) Origin B) Axes C) x-axis D) None

105. The line y = 5 is parallel to [ ]

A) x-axis B) y-axis C) origin D) None

106. The line x = 3 is perpendicular to [ ]

A) x-axis B) y-axis C) origin D) None

107. The X axis is represented by the equation [ ]

A) x =0 B) y=0 C) (x, y) (0,1) D) None

108. The general form of a straight line is [ ]

A) y = m B) y = x C) y = mx+c D) y = c

109. The y intercept of the line y = 4x+5 is [ ]

A) 4 B) 5 C) 1 D) 0

110. The slope of x axis is [ ]

A) 0 B) 1 C) Not defined D) None

111. The slope of y axis is [ ]

A) 0 B) 1 C) Not defined D) None

112. If slope of two lines are equal then the lines are [ ]

A) Perpendicular B) Parallel C) equal D) Non parallel

113. The boundary line for $x > 2$ is [ ]

A) x B) 2 C) $x = 2$ D) $x < 2$

114. When a plane includes the boundary line then the plane is called[ ]

A) Half half B) full half C) closed half D) open half

115. The order pair which include $x + y < 0$ is [ ]

A) (4,5) B) (10,6) C) (2,0) D) None

116. A point which satisfies the equation $x + y + 3 = 0$ is [ ]

A) (5,6) B) (2,3) C) (-6,3) D) (6,-4)

117. When the slopes of lines increases then the lines move towards[ ]

A) X axis B) Y axis C) Origin D) None

118. The graph of $x + y = 5$ and $6x + 6y = 30$ is [ ]

A) ——— B) $\perp$ C) X-axis D) Origin

———

119. Which of the line passes through origin ? [ ]

A) y = x + 3 B) y = x -2 C) y = 2x D) None

120. The distance between the origin and the point of intersection of straight line with y axis is called. [ ]

A) X intercept B) X intercept C) Zen intercept D) None

121. A straight line passes through the origin when the y intercept is[ ]

A) 0 B) 1 C) 2 D) 10

122. The solution set for x+3y = 15, 3x+2y =17 is [ ]

A) (3,4) B) (4,3) C) (7,-3) D) None

123. The intersection of $Q_1$ and $Q_2$ is [ ]

A) $y \geq 0$ B) $Q_4$ C) $\phi$ D) None

124. If $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ then the equation are called [ ]

A) Consistent B) Inconsistent C) Dependent D) None

125. The ratio between y coordinate to x coordinate is called [ ]

A) Intercept B) Root C) Slope D) None

125. If 2x + y = 11 and 2x - 2y = 8 then (x, y) = [ ]

A) (2, 3) B) (3, 2) C) (0, 1) D) None

126. 5x + 5y = 25 and x + y = 5 are the examples of ..... equations

A) Independent B) dependent C) Inconsistent D) None

127. Number of solutions for inconsistent equations [ ]

A) 0 B) 1 C) infinite D) None

128. The sum of 3 consecutive even numbers is 156. The largest number is

A) 52 B) 54 C) 50 D) none

129. The process expressing an expression as the product of two or more than two expression is called [ ]

A) Factorisation B) Transposition C) Super position D) None

130. If a trinomial is a perfect square then it must be the square of a[ ]

A) Tetranomial B) Monomial C) Trinomial D) Binomial

131. $\sqrt{-\left(a^2-2ab-b^2\right)} =$ [ ]

A) (a + b) B) (a – b) C) ab D) None

132. Factors of $\pi R^2 - \pi r^2$ are [ ]

A) $\pi(R+r)^2$ B) $\pi(R+r)(R-r)$ C) $\pi(R-r^2)$ D) None

133. The value of $\frac{51^2-49^2}{51-49}$ *is* [ ]

A) 2496 B) 100 C) 2 D) None

134. If a + b + c = 0 then $a^3 + b^3 + c^3$ = [ ]

A) 3 B) 3 abc C) 0 D) None

**MENSURATION**

135. Number of edges of a cube is [ ]

A) 4 B) 8 C) 12 D) 16

136. Number of vertices of a cuboid is [ ]

A) 6 B) 8 C) 12 D) 4

137. A polyhedron is a solid bounded by [ ]

A) Squares B) Rectangles C) triangles D) Polygons

138. Rotation solid of the following is [ ]

A) Cone B) Cube C) Prism D) Pyramid

139. L.S.A of cuboid is [ ]

A) $4S^2$ B) $6S^2$ C) 2h $(\ell+b)$ D) $2(\ell b+bh+\ell h)$

140. The volume of a prism is 120 $m^3$ and area of its base is 15$m^2$. The height of the prism is [ ]

A) 8m B) 60m C) 240m D) 1800m

141. Diagonal of cube of side $\sqrt{27}$ cm is [ ]

A) 3 cm B) 6 cm C) 9 cm D) 27 cm

142. Total surface area of cylinder is [ ]

A) $\pi r\ell$ B) $2\pi r(r+h)$ C) $2\pi rh$ D) $\pi r(r+\ell)$

143. Slant height of frustum of radii 9 cm, 3cm and height being 8 cm is

A) 6 cm B) 8 cm C) 10 cm D) 12 cm

144. Diagonal of cuboid with dimensions 3cm x 4 cm x 5 cm is [ ]

A) $2\sqrt{5}$ B) $5\sqrt{2}$ cm C) 60 cm D) 12 cm

145. Volume of hemi sphere is [ ]

A) $\frac{4}{3}\pi r^3$ B) $4\ \pi r^2$ C) $\frac{2}{3}\pi r^3$ D) $2\pi r^2$

146. C.S.A of a frustum is [ ]

A) $\pi r\ell$ B) $\pi r(r+\ell)$ C) $2\ \pi rh$ D) $\pi\ell(R+r)$

147. Total surface area of hemisphere is [ ]

A) $3\ \pi r^2$ B) $4\pi r^2$ C) $2\ \pi r^2$ D) $\pi r^2$

148. The ratio between total length of the circle to the diameters of the circle is

A) Radius B) $\pi$ C) 1 D) None

149. Slant height of pyramid, of height 3 cm and base radius 4 cm is[ ]

A) 3cm B) 4cm C) 5 cm D) 7 cm

150. In an oblique prism, the lateral faces are [ ]

A) Squares B) Parallelograms C) rectangles D) triangles

151. The base area of a cone is [ ]

A) $2\ \pi r$ B) $2\ \pi r^2$ C) $\pi rl$ D) $\pi r^2$

152. C.S.A of a cylinder of height 14cm and radius 5 cm is [ ]

A) 220 $cm^2$ B) 70 $cm^2$ C) 440 $cm^2$ D) 340 $cm^2$

153. Set of all points in a plane which are equidistant from a fixed point is a

A) Square B) cube C) circle D) sphere

154. Set of all points in space which are equidistant from a fixed point is a

`A) Cube B) cone C) circle D) sphere

155. Volume of pyramid is [ ]

A) $\pi r^2$h B) $\frac{1}{3}\pi r^2 h$ C) $\frac{1}{3}Ah$ D) $\frac{1}{2}pl$

156. Number of soaps of size 2 cm x 3 cm x 5 cm that can be possible to keep in a box with dimensions 8cm x 12cm x 25 cm is [ ]

A) 30 B) 80 C) 200 D) 120

157. The vertical cross section of a cone is [ ]

A) Circle B) Rectangle C) Triangle D) Semi circle

158. The horizontal cross section of a triangular based pyramid is[ ]

A) Square B) rectangle C) parallelogram D) triangle

159. The vertical cross section of a right cylinder is [ ]

A) Circle B) Triangle C) Rectangle D) Parallelogram

LOGORITHMS

160. $\log_a mn$ = [ ]

A) $\log_a{}^m \log_a{}^n$ B) $m\log_a{}^n$ C) $n\log_a{}^m$ D) $\log_a{}^m + \log_a{}^n$

161. $\log_y{}^x \log_z{}^y \log_x{}^z =$ [ ]

A) $\log_z{}^x$ B) 0 C) 1 D) $\log_x xyz$

162. $\frac{1}{\log_a{}^{ab}} + \frac{1}{\log_b{}^{ab}} =$ [ ]

A) 0 B) $\log_{ab} a^2 b^2$ C) $\frac{1}{2\log ab}$ D) 1

163. $\log_4{}^2 + \log_8{}^2 - \log_{16}{}^2 =$ [ ]

A) 1/12 B) 0 C) 7/12 D) 3/16

164. If $\log_x{}^2 + \log_x{}^4 + \log_x{}^8 = 3$ *then x is* [ ]

A) 4 B) 2 C) 8 D) 16

165. $x^{\log x^a} =$ [ ]

A) x B) a C) 0 D) 1

166. If $\log_4 (\log_3 x) = \frac{1}{2}$ *then* $x =$ [ ]

A) 6 B) 9 C) 12 D) 3

167. $\log\left(\frac{a^2}{b}\right) + \log\left(\frac{b^2}{c}\right) + \log\left(\frac{c^2}{a}\right) - \log(abc) =$ [ ]

A) 0 B) 1 C) log abc D) 2 log abc

168. If $\frac{\log_3^{64}}{\log_9^8}$ = then the value of x is [ ]

A) 3 B) 4 C) 8 D) None

169. If $\log_9^x + \log_3^x = 3$ then x = [ ]

A) 3 B) 9 C) 18 D) 36

170. If $\log_2(x+5)+\log_2(x-2)=3$ *then* $x=$ [ ]

A) 3 B) 5 C) 6 D) 7

171. The value of $\frac{2}{3}\log 8-\frac{1}{2}\log\left(\frac{1}{4}\right)$ *is* [ ]

A) 2 log 3 B) 3 log 2 C) 3 log 5 D) 4 log 6

172. If $x=\log_7^9$ ; y = $\log_5^7$ ; $z=\log_3^5$ *then* $xyz=$ [ ]

A) 2 B) 5 C) 7 D)9

173. If abc = 1 then $\frac{1}{\log_a^x}+\frac{1}{\log_b^x}+\frac{1}{\log_c^x}=$ [ ]

A) 0 B) 1 C) 3 D) x

174. If $a^2+b^2=c^2$ then $\log_a(c+b)+\log_a(c-b)=$ [ ]

A) 1 B) 2 C) 0 D) $a^2$

175. If loga – log b = log (a-b) and $b\neq 1$ then a = [ ]

A) $\frac{b}{b-1}$ B) $\frac{b}{b+1}$ C) $\frac{b^2}{b-1}$ D) $\frac{b^2}{b+1}$

176. $\log(1+2+3)=$ [ ]

A) log1. log2 . log 3 B) log1 + log2 + log 3

C) (log1 + log2) log3 D) None

177. If $\log_{10}^2=a$ *then* $\log_{10}^5=$ [ ]

A) 1/a B) 1/1-a C) 1/1+a D) 1 - a

178. If $\log_x^8<\log_x^{10}$ *then* [ ]

A) x < 1 B) x > 1 C) x = 0 D) x = 1

179. If $\log_a^5>\log_a^{25}$ *then* [ ]

A) a < 1 B) a = 0 C) a > 1 D) None

180. Exponential form of $\log_a^x=p$ *is* [ ]

A) $a^x=p$ B) $x^p=a$ C) $a^p=x$ D) $p^a=x$

181. The logarithmic form of $2^3=8$ is [ ]

A) $\log_2^3=8$ B) $\log_2^8=3$ C) $\log_3^8=2$ D) $\log_3^2=8$

182. $\log_{10}^1\times\log_{10}^2\times\log_{10}^3\times\ldots\ldots\ldots\times\log_{10}^{10}=$ [ ]

A) 0 B) 1 C) 10 D) 50

183. Irrational number in the following is [ ]

A) $\log_{10}^{1}$ B) $\log_{10}^{10^3}$ C) $\log_{2}^{3}$ D) None

184. Logarithm of unity to any non zero base is [ ]

A) 0 B) 1 C) infinite D) does not exist

185. log 3+ log 4 = [ ]

A) log 12 B) log 7 C) 12 D) 7

186. log 12 – log 2 - log 3 [ ]

A) log 2 B) log 7 C) log $\frac{12}{5}$ D) log $\frac{10}{3}$

187. $log_{10}^{10000}$ = [ ]

A) 1 B) 2 C) 3 D) 4

188. $\frac{\log 125}{\log 25}$ = [ ]

A) log 5 B) 5 C) 3/2 D) log 100

189. logarithmic from of $2^{10} = 1024$ is [ ]

A) $\log_{2}^{10} = 1024$ B) $\log_{10}^{1024} = 2$ C) $\log_{2}^{1024} = 10$ D) None

190. Exponential form of $\log_{0.1}^{0.001} = 3$ is [ ]

A) $3^{0.1} = 0.001$ B) $(0.1)^3 = 0.001$ C) $(0.001)^3$ D) None

191. Logarithms was introduced by [ ]

A) Arthur Caulay B) Pascal C) George cantor D) John Napier

192. $\log_{y}^{x} \times \log_{x} y^2$ = [ ]

A) $y^2$ B) log x $y^2$ C) 2 D) log $(x+y^2)$

193. $\frac{1}{\log_a abc} + \frac{1}{\log_b abc} + \frac{1}{\log_c abc}$ [ ]

A) 0 B) 1 C) x D) 1/x

194. $\log_x 1 \ (x > 0)$ = [ ]

A) 0 B) 1 C) x D) 1/x

195. log $\frac{c}{d}$ - log $\frac{cy}{dx}$ = [ ]

A) log y/x B) log x/y C) log (x-y) D) log (y-x)

196. $\log_a^y \div \log_a^x$ = [ ]

A) log y/x B) log (y-x) C) log (yx) D) $\log_x^y$

197. $\log_{343}^{49}$ = [ ]

A) 2/3 B) 3/2 C) 2 D) 1/2

198. if $x^2+y^2=z^2$ then $\log_x (z-y) + \log_x (z+y)$ = [ ]

A) $x^2$ B) 2 C) 1 D) 0

199. $2 \log \frac{5}{8} + \log \frac{128}{125} + \log \frac{5}{2}$ = [ ]

A) 3 B) 2 C) 1 D) 0

200. $10^{\log_{10}^5}$ [ ]

A) 10 B) 2 C) 50 D) 5

201. Logarithm of any non zero positive number to the same base is

A) 0 B) 1 C) Not defined D) itself

202. If $\log_x^2 + \log_x^4 + \log_x^8 = 1$ *then* $x$ = [ ]

A) 4 B) 16 C) 64 D) 256

203. If $\log_2 (\log_3 x) = 2$ then x = [ ]

A) 9 B) 18 C) 27 D) 81

204. $\log \left(\frac{l^2}{m}\right) + \log \left(\frac{m^2}{n}\right) + \log \left(\frac{n^2}{l}\right) - \log (lmn)$ = [ ]

A) lmn B) $l^2$ $m^2$ $n^2$ C) 1 D) 0

205. If $\log_5^x + \log_5^{x^2} + \log_5^{x^3} = 6$ *then* $x$ = [ ]

A) 2 B) 3 C) 5 D) 6

206. If x y z =1 then $\frac{1}{\log_x^a} + \frac{1}{\log_y^a} + \frac{1}{\log_z^a}$ = [ ]

A) $\log_a xyz$ B) $\log_{xyz} a$ C) 0 D) 1

207. $\log_n \left(1-\frac{1}{2}\right) + \log_n \left(1-\frac{1}{3}\right) + \ldots\ldots + \log_n \left(1-\frac{1}{n}\right)$ = [ ]

A) 0 B) 1 C) 2 D) -1

208. $\log_{10}5 \times \log_{6}10 =$ [ ]

A) $\log_{6}5$ B) $\log_{5}6$ C) $\log_{5}10$ D) None

209. $\frac{1}{\log_{ab} abc} + \frac{1}{\log_{bc} abc} + \frac{1}{\log_{ca} abc} =$ [ ]

A) -2 B) 2 C) -1 D) 1

210. Equation of a line passing through (5, -2) and making equal intercepts on the axes is.

A) 5x – 2y = 0 B) x+y = 7 C) x+y = 0 D) x+y = 3

211. Pair of perpendicular lines : [ ]

A) y = 3x; x = -3y B) y = 8; x = 4 C) y = 3x; x = $\frac{1}{3}y$ D) x=8; y=4

212. The X intercept made by the line 4x – 5y = 20 is [ ]

A) – 4 B) 4 C) 5 D) - 5

213. Two lines are parallel if their slopes are [ ]

A) equal B) zero

C) product of slopes is – 1 D) reciprocals of each other

214. The slope of a line perpendicular to the line 5x – 2y + 4 = 0 is [ ]

A) $\frac{2}{5}$ B) $-\frac{2}{5}$ C) 2 D) $\frac{5}{2}$

215. The slope of the line ax + by + c = 0 where $|a| + |b| \neq 0$ [ ]

A) $-\frac{b}{a}$ B) $\frac{a}{b}$ C) $-\frac{a}{b}$ D) $\frac{b}{a}$

216. If a line makes $120^0$ angle with the positive direction of X-axis, its slope is

A) $\sqrt{3}$ B) $-\sqrt{3}$ C) $-\frac{1}{\sqrt{3}}$ D) $\frac{1}{\sqrt{3}}$

217. The equation of the line passing through (1, 1) and (2, 3) : [ ]

A) y = 2x + 1 B) 2y = x + 1 C) 2y = x-1 D) y = 2x - 1

218. If a and b are positive, the distance between the points (-a, a) and (b, - b) is

A) $\sqrt{2a}$ B) $\sqrt{2b}$ C) $\sqrt{2}(a-b)$ D) $(a+b)\sqrt{2}$

219. The distance between the points ($\sin\alpha$, $\cos\alpha$) and ($\cos\alpha$, $-\sin\alpha$) is [ ]

A) 1 B) $\sqrt{8}$ C) $\sqrt{2}$ D) none

220. If (x, y) is equidistant from (6, -1) and (2, 3) then the relation between x and y is

A) x + y = - 3 B) x – y – 3 C) x – y = 3 D) x + y = 3

221. The perimeter of the triangle formed by the points $(\sqrt{3}, 0)(-\sqrt{3}, 0)$ *and* $(0, 2)$ is

A) $2(\sqrt{3}-\sqrt{7})$ B) $\sqrt{3}+\sqrt{7}$ C) $\sqrt{3}-\sqrt{7}$ D) $2(\sqrt{3}+\sqrt{7})$

222. If (2, -2) and (5, 2) are the opposite ends of a square, then the length of the side of the square is [ ]

A) $5\sqrt{2}$ B) $\frac{5}{\sqrt{2}}$ C) $2\sqrt{5}$ D) None

223. The triangle formed by the points (2, 7), (4, -1), (- 2, 6) is [ ]

A) Isosceles B) equilateral C) right angled D) scalene

224. The images of the unit (7, 8) in X and Y axes respectively are [ ]

A) ( -7, 8) & (7, - 8) B) (7, - 8) & (-7, 8) C) (7, 8) & (8, 7) D) none

225. If A (x, 4), B (1, -2) & C(-3, 2) form an isosceles triangel at the vertex B, then x is

A) 0 B) 1 C) 2 D) none

226. If a and b are two non-zero real numbers, the centre of the circle passing through the points (0, 0), (a, 0) and (0, b) is [ ]

A) $\left(\frac{a}{3}, \frac{b}{3}\right)$ B) $\left(\frac{a}{4}, \frac{b}{4}\right)$ C) (a, b) D) $\left(\frac{a}{2}, \frac{b}{2}\right)$

227. The points (-1, 5), (-2, 3), (5, 7), (6, 9) form [ ]

A) a rectangle B) a parallelogram C) a square D) a rhombus

228. The points on X-axis which are 5 units away from (2, 3) are [ ]

A) (4, 0), (7, 0) B) (2, 3), (5, 0) C) (0, 6), (2, 0) D) (6, 0), (- 2, 0)

229. The points (0, 0), (3, 4) (7, 7), (4, 3) form [ ]

A) a rhombus B) a rectangle C) a square D) none

230. The points (0, -1), (-2, 3), (6, 7), (8, 3) from [ ]

A) a rhombus B) a parallelogram C) a square D) a rectangle

231. y = 2x + 1 and y = 2x – 3 represent a pair of [ ]

A) perpendicular lines B) parallel lines C) concurrent lines D)None

232. The equation of a line passing through the origin is [ ]

A) x = 4 B) y = - 3 C) y = 2x + 5 D) x = y

233. The distance between the points ( a cos $\alpha$ , 0 ) and ( 0, a sin $\alpha$ ) is [ ]

A) a B) $|a|$ C) $|2a|$ D) 2a

234. If the distance between the points (k, 2) and (3, 4) is 8, then k = [ ]

A) 2 B) 3 C) $\sqrt{60}$ D) $3 \pm \sqrt{60}$

235. The remainder when f(x) is divided by (ax-b) is [ ]

A) $-\frac{b}{a}$ B) $\frac{b}{a}$ C) $f\left(-\frac{b}{a}\right)$ D) $f\left(\frac{b}{a}\right)$

236. (x+a) is a factor of f(x), if [ ]

A) $f\left(\frac{1}{a}\right)=0$ B) f(a) = 0 C) $f\left(-\frac{1}{a}\right)=0$ D) f(-a) = 0

237. The value of k, if (x-1) is a factor of $2x^3-5x^2+kx+7$ is [ ]

A) 0 B) 4 C) -4 D) 14

238. If (x+1) is factor of $ax^2 + bx + c$, then ; [ ]

A) a + c = bB) a + b + c = 0 C) a + b = c D) b + c = 0

239. The remainder when f(x) is divided by 3x+2 is [ ]

A) -2/3 B) $f\left(-\frac{2}{3}\right)$ C) $f\left(\frac{2}{3}\right)$ D) $f\left(-\frac{3}{2}\right)$

240. A fourth degree polynomial in x is divided by x – 1. The degree of the quotient is [ ]

A) 5 B) 2 C) 3 D) 4

241. Condition for (x-1) to be a factor of $ax^3+bx^2+cx+d$ is [ ]

A) a+c = b + d B) a+b+c+d=0

C) a+b=c+d D) a+d=b+c

242. The remainder when $4x^3-3x+9$ is divided by (2x-3) = [ ]

A) 18 B) -18 C) 9 D) -36

243. $X^n + y^n$ is divisible by x+y when n is [ ]

A) even B) prime C) both even and odd D) odd

244. A factor of $5^{2n} - 1$ ($n \in N$) is [ ]

A) 10 B) 48 C) 24 D) 25

245. If $px^2 + qx + r$ is divisible by (x-1) then [ ]

A) p+q+r = 0 B) p+r=q C) p+q=r D) p+q+r ≠ 0

246. The value of k, if x –1 is a factor of $2x^3 - 5x^2 + kx + 7$ is [ ]

A) 14 B) –4 C) 4 D) 0

247. Which of the following is not a polynomial in x ? [ ]

A) $x^5$ B) 5x C) $x^{-2}$ D) $2x^2-7x+5$

248. (x-a) is a factor of f(x), if. [ ]

A) f(-a)=0 B) f(a) = 0 C) $f\left(-\frac{1}{a}\right)=0$ D) $f\left(\frac{1}{a}\right)=0$

249. One of the factors of $x^4 + 4$ is [ ]

A) $x^2+2$ B) $x^2 - 2x+2$ C) $x^2 - 2$ D) None of these

250. The factors of $\frac{x^2}{4}-\frac{y^2}{9}$ are : [ ]

A) $\left(\frac{x}{4}+\frac{y}{9}\right)\left(\frac{x}{4}-\frac{y}{9}\right)$ B) $\left(\frac{x}{2}+\frac{y}{9}\right)\left(\frac{x}{2}-\frac{y}{9}\right)$

C) $\left(\frac{x}{2}+\frac{y}{3}\right)\left(\frac{x}{2}-\frac{y}{3}\right)$ D) None of these

251. The factors of $1-p^3$ are : [ ]

A) $(1-p)\ (1+p+p^2)$ B) $(1+p)\ 1-p-p^2)$ C) $(1+p)\ (1+p^2)$ D) $(1+p)\ (1-p^2)$

252. One of the factors of $a^3(b-c)^3 + b^3(c-a)^3+c^3(a-b)^3$ is [ ]

A) a-b B) b-c C) c-a D) all the above

253. Factors of $a^2+4a+4$ are : [ ]

A) $(a+2)^2$ B) $(a+1)^2$ C) $(a-2)^2$ D) $(a-1)^2$

254. $X^3+6x^2+9x$ can be factorised as : [ ]

A) $x^2(x+2)^2$ B) $x(x+3)^2$ C) x (x+3) D) None of these

255. Factors of $8x^3 + 27y^3$ are [ ]

A) $(x+2)\ (x^2-2x+4)$ B) $(3x+4)\ (ax^2-12x+16)$

C) $(2x+3y)\ (4x^2-6xy+9y^2)$ D) (x-1) (x2+4x+7)

256. If x+y+z = 0, then $x^3 + y^3 + z^3$ [ ]

A) 3xyz B) $x^2yz$ C) $xy^2z$ D) $xyz^2$

257. Factors of $27-6x-x^2$ are : [ ]

A) (3-x) (9+x) B) (x-3) (x+9) C) (x-2) (x+7) D) None of these

258. Factors of $x^6+9x^3+8$ are [ ]

A) (x-2) ($x^2$+2x+4) B) (x+2) (x2-2x+4) (x+1) (x2-x+1)

C) (x+4y) (x-4y) (x+2y) (x-2y) D) None of these

259. $3x^2$ -17x+20 can be factorised as : [ ]

A) (x+4) (3x+5) B) (x-4) (3x-5)

C) (x-4) (x-5) D) None of these

260. Number of surfaces of a regular prism of n sides is [ ]

A) 3n B) 2n C) n - 2 D) n + 2

261. Number of vertices of a regular hexagonal prism is [ ]

A) 6 B) 12 C) 18 D) 8

262. The total length of all the edges of a cube of side 8 cm is [ ]

A) 64 cm B) 48 cm C) 96 cm D) 80 cm

263. The volume of a cube is 216 $(cm)^3$. Its lateral surface area in $(cm)^2$ is [ ]

A) 216.$(cm)^2$ B) 96 $(cm)^2$ C) 72 $(cm)^2$ D) 144 $(cm)^2$

264. The base of a regular prism is an equilateral triangle of side 12 cm. The height of the prism is 25 cm. The lateral surface area of the prism is

A) 300 $(cm)^2$ B) 600 $(cm)^2$ C) 900 $(cm)^2$ D) 450 $(cm)^2$

265. The total surface area of a cube of side 30 cm in $(cm)^2$ is [ ]

A) 3600 B) 900 C) 480 D) 5400

266. The lateral surface area of a cuboid is 180 $(cm)^2$. Its length and breadth are respectively 10 cm and 8 cm. Its height in cm is [ ]

A) 10 B) 5 C) 20 D) 222

267. The base of a right pyramid is a square of side 14 cm and its slant height is 13 cm. Its vertical height in cm is [ ]

A) 12 B) 24 C) 20 D) 6

268. The curved surface area of a cylinder of height 10 cm, if the diameter of its base is 8 cm is (in sq.cm) [ ]

A) 40 $\pi$ B) 20 $\pi$ C) 160 $\pi$ D) 80 $\pi$

269. The vertical cross section of a regular cylinder is a [ ]

A) Circle B) Rectangle C) Equilateral triangle D) Any triangle

270. The formula to find the total surface area of a right cylinder of radius 'r' and height 'h' is, A = [ ]

A) $2\pi rh + \pi r^2$ B) $\pi rh + 2\pi r^2$ C) $2\pi rh + 2\pi r^2$ D) $\pi rh + \pi r^2$

271. A rectangular zinc sheet measuring 44 cm x 22 cm is bent so as to form a cylinder of height 22 cm. Then the radius of the base of the cylinder in cm is,

A) 14 B) 3.5 C) 28 D) 7

272. The heights of two cylinders are equal. Their radii are in the ratio of 4 : 3. The ratio of their curved surface areas is [ ]

A) 4 : 3 B) 3 : 4 C) 16 : 9 D) 9 : 16

273. Two cylinders of equal heights have their radii in the ratio of 2 : 5. The ratio of their volumes is [ ]

A) 2 : 5 B) 5 : 2 C) 4 : 25 D) 25 : 4

274. The volume of a hollow cylinder of 'r' and 'R' and height 'h' is, [ ]

A) $2\pi$(R+r) )(R-r)h B) $\pi$(R+r) )(R-r)h

C) $\pi$(R+r) )(R-r) $\frac{h}{2}$ D) $\pi^2$(R+r) )(R-r)h

275. The total surface area of a cube of side 10 cm. Is in (sq. cms.) [ ]

A) 400 B) 100 C) 1000 D) 600

276. The volume of a cubiod is 1,200 cu. Cm. The length and breadth are 15 cm. ; 10 cm. Its height is [ ]

A) 12 B) 8 C) 80 D) 10

277. The base of a prism is a rhombus with diagonals 16 cm. ; 24 cm. Height of the prism is 20 cm. Volume is [ ]

A) 7680 B) 2560 C) 3840 D) 800

278. The area of four walls of room 12 mts. x 8 mts. x 10 mts. is (in sq. mts)

A) 960 B) 560 C) 200 D) 400

279. The base of a right pyramid is a square with side 6 cm. ; Height of the pyramid is 4 cm. Volume of the pyramid is (cu. Cms.) [ ]

A) 72 B) 48 C) 144 D) 24

280. If the base of a prism is circular, it is called [ ]

A) Cylinder B) Cuboid C) Cube D) Pyramid

281. Radius 7 cm. ; height 10 cm. Then the curved surface area of the cylinder is (sq. cm)

A) 70 B) 220 C) 440 D) 1540

282. The cross section by a vertical plane of a cylinder is [ ]

A) rhombus B) rectangle C) square D) prism

283. There is a rectangular piece of paper. The figure formed by rolling the paper along its length is [ ]

A) pyramid B) cone C) cylinder D) rectangle

284. Volume of a cylinder [ ]

A) $2\pi rh$ B) $\pi r^2 h$ C) $2\pi r^2 h$ D) $2\,2\pi r\,(h+r)$

285. If 1, 1, $\alpha$ are the roots of $x^3-6x^2+9x-4 = 0$ then $\alpha$ = [ ]

A) – 4 B) 4 C) – 6 D) 6

286. If –1, 2 $\alpha$ are the roots of $2x^3 + x^2 - 7x - 6 = 0$ then $\alpha$ = …… [ ]

A) $\frac{-3}{2}$ B) $\frac{3}{2}$ C) 3 D) -3

287. If sum of the roots of the equation $5x^4 - kx^3 + 8x + 1 = 0$ is 6 then K = [ ]

A) 6 B) -6 C) –30 D) 30

288. If $\alpha, \beta, \gamma, \delta$ are the roots of the equation $3x^4-8x^3+2x^2-9 = 0$ then $\sum\alpha\beta$ = [ ]

A) $\frac{2}{3}$ B) $\frac{-2}{3}$ C) $\frac{8}{3}$ D) $\frac{-8}{3}$

289. If, $\alpha,\beta,\gamma,\delta$ are the roots of the equation $9x^4+kx^2-7x+4 = 0$ and $\sum\gamma\delta = 2$ then K =

A) 18 B) -18 C) 9 D) 2

290. If $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ are the roots of the equation $7x^4 + 2x^3 - 4x + 11 = 0$ then $\sum\alpha_1\alpha_2\alpha_3 =$ [ ]

A) $\frac{-4}{7}$ B) $\frac{4}{7}$ C) $\frac{2}{7}$ D) $\frac{-2}{7}$

291. The roots of $x^3+x^2-4x-4 = 0$ are [ ]

A) –1, -2, -2 B) –1, -2, 2 C) 1,-2, 2 D) –2, 2, 4

292. The roots of $x^3-12x^2+39x-28 = 0$ are [ ]

A) 1, -4, 7 B) 1, 4, -7 C) 1, 4, 7 D) 1, -4, -7

293. The roots of $x^3 + x^2-16x+20 = 0$ are [ ]

A) 2,2,-5 B) 2,2,-4 C) 2,-2,-5 D) –2,-2,5

294. The roots of the equation $x^3-9x^2+14x+24=0$ are [ ]

A) –1, -4, 6 B) –1, 4, -6 C) –1, -4, -6 D) –1, 4, 6

295. The roots of the equation $x^3 - 5x^2 - 2x + 24 = 0$ are [ ]

A) –2,-3,4 B) –2,3,4 C) –2,3,-4 D) 2,-3,-4

296. If $\alpha, \beta, \gamma$ are the roots of the equation $2x^3 – x^2 + x-1 = 0$ then $\alpha^2 + \beta^2 + \gamma^2 =$ [ ]

A) $\frac{5}{4}$ B) $\frac{3}{4}$ C) $\frac{-5}{4}$ D) $\frac{-3}{4}$

297. If $3x^4 -27x^3 + 36x^2 -5 = 0$ then $s_1 + s_2 =$ [ ]

A) 3 B) 21 C) –21 D) -3

298. If $x^4-2x^3-4x^2-4x+4 = 0$ then $2s_1-s_2+s_3-s_4 =$ [ ]

A) 3 B) 2 C) 1 D) 0

299. If $7x^4+kx-9 = 0$ and $s_3 = -8$ then K = [ ]

A) 28 B) -28 C) 56 D) -56

300. If $2x^9-5x^4+k = 0$ and $s_9 = 16$, then k = [ ]

A) 16 B) -16 C) 32 D) -32

301. If one root of $x^3+2x^2+3x+k=0$ is the sum of the other two roots then K =

A) 0 B) 1 C) 2 D) 3

302. If the product of two of the roots $x^3 -kx^2+5x+3 = 0$ is –1 then k = [ ]

A) 2 B) 3 C) 4 D) 5

303. If 1, 3, -4 are the roots of $x^3+kx+12 = 0$ then K = [ ]

A) 11 B) -11 C) 13 D) -13

304. If the equation $2x^3-9x^2+12x+k = 0$ has two equal roots then k =

A) -5 B) 5 C) 4 D) 6

305. If one root of $x^3 - 5x^2 + 2x + 8 = 0$ is double the other, then the roots are [ ]

A) –1,3,6 B) –1, 2, 4 C) 1,2,4 D) 1,3,6

306. The equation whose roots are 1,1,-2 is [ ]

A) $x^3+3x-2 = 0$ B) $x^3+x-2 = 0$ C) $x^3+2x-3 = 0$ D) $x^3 - 3x + 2=0$

307. The equation whose roots are 0,0,3, -4 is [ ]

A) $x^4+x^3+12x^2 = 0$ B) $x^4+x^3-12x^2 = 0$ C) $x^4-x^3+12x^2 = 0$ D) $x^4-x^3-12x^2=0$

308. The condition that the roots of $ax^3 + bx^2 + cx + d = 0$ may be in A.P. if [ ]

A) $2b^3+27a^2d = 9$ abc B) $2b^3+27a^2d = -9$ abc

C) $2b^3-27a^2d=9$abc D) $2b^3-27a^2d=-9$abc

309. The condition that the roots of $ax^3+bx^2+cx+d=0$ may be in G.P. if [ ]

A) $ab^3 = c^2d$ B) $a^3c=bd^3$ C) $ac^3 = b^3d$ D) $a^3b=cd^3$

## MATRICES

310. Square root of $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ [ ]

A) $\pm\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$ B) $\pm\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$ C) $\pm\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ D) $\pm\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$

311. If $A = \begin{pmatrix} i & 0 \\ 0 & -i \end{pmatrix}$ then $A^2$ = [ ]

A) $\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$ B) $\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$ C) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ D) $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$

312. If $A = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{pmatrix}$, $B = \begin{pmatrix} 1 \\ 0 \\ 5 \end{pmatrix}$, then AB = [ ]

A) [1 0 15] B) [4 0 30] C) $\begin{pmatrix} 16 \\ 34 \end{pmatrix}$ D) [16 34]

313. If $P = \begin{pmatrix} 1 \\ 3 \\ 4 \end{pmatrix}$, Q = [2 -1 5], then PQ = [ ]

A) $\begin{pmatrix} 2 & -1 & 5 \\ 6 & -3 & 15 \\ 8 & -4 & 20 \end{pmatrix}$ B) [2 -3 20] C) $\begin{pmatrix} 2 \\ -3 \\ 20 \end{pmatrix}$ D) [19]

314. If $A = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, then AB + BA = [ ]

A) A B) 2A C) 3A D) 4A

315. If $A = \begin{pmatrix} a & 0 \\ a & 0 \end{pmatrix}$, $B = \begin{pmatrix} 0 & 0 \\ b & b \end{pmatrix}$, then AB = [ ]

A) 0 B) bA C) aB D) ab AB

316. If $A = \begin{pmatrix} i & 0 \\ 0 & -i \end{pmatrix}$, $B = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$, $C = \begin{pmatrix} 0 & i \\ i & 0 \end{pmatrix}$, then $A^2+B^2+C^2$ = [ ]

A) $2I$ B) $-2I$ C) $-3I$ D) $3I$

317. If $A = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$, then $A^4$ = [ ]

A) $I$ B) 0 C) A D) $4I$

318. If $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ *and* $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ *then* $A^2-(a+d)A-(bc-ad)I$ = [ ]

A) O B) $I$ C) $2I$ D) (a – d)

319. $\begin{pmatrix} x & 0 \\ 0 & y \end{pmatrix}\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ = [ ]

A) $\begin{pmatrix} ax & bx \\ yc & dy \end{pmatrix}$ B) $\begin{pmatrix} ax & 0 \\ 0 & dy \end{pmatrix}$ C) $\begin{pmatrix} ay & cy \\ bx & dy \end{pmatrix}$ D) $\begin{pmatrix} 0 & ax \\ dy & 0 \end{pmatrix}$

320. If A and B are two n x n matrices then $(A+B)^2$ = [ ]

A) $A^2+2AB+B^2$ B) $A^2+AB+BA+B^2$ C) $A^2 + B^2$ D) A + B

321. If AB = A and BA = B then [ ]

A) A = 2B B) $A^2 =$ A and $B^2 = B$

C) 2A = B D) Cannot be determined

322. If A = [x y], B = $\begin{pmatrix} a & h \\ h & b \end{pmatrix}$, $C = \begin{pmatrix} x \\ y \end{pmatrix}$, then ABC = [ ]

A) (ax+hy+bxy) B) $(ax^2+2hxy+by^2)$

C) $(ax^2-2hxy+by^2)$ D) $(bx^2-2hxy+ay^2)$

323. If $\begin{pmatrix} x & 1 \\ 1 & y \end{pmatrix} \begin{pmatrix} 1 & 4 \\ 2 & 6 \end{pmatrix} = \begin{pmatrix} 4 & 14 \\ 7 & 22 \end{pmatrix}$, then (x,y) = [ ]

A) (1, -2) B) (2, 1) C) (3, 2) D) (2, 3)

324. $A_{nxn}$ and $B_{nxn}$ are diagonal matrices then AB = ..... matrix [ ]

A) square B) diagonal C) scalar D) rectangular

325. If A = diagonal [3 3 3] then $A^4$ = [ ]

A) 12A B) 81A C) 684A D) 27A

326. If A = $\begin{pmatrix} 1 & -1 \\ 1 & 0 \end{pmatrix}$ *then* $A^T$ [ ]

A) $\begin{pmatrix} 1 & 1 \\ -1 & 0 \end{pmatrix}$ B) $\begin{pmatrix} 0 & -1 \\ 1 & 1 \end{pmatrix}$ C) $\begin{pmatrix} -1 & 1 \\ 1 & 1 \end{pmatrix}$ D) $\begin{pmatrix} -1 & -1 \\ -1 & 1 \end{pmatrix}$

327. If A = $\begin{pmatrix} 0 & 1 & -2 \\ 1 & 0 & 3 \\ 2 & -3 & 0 \end{pmatrix}$ *then* $A + A^T$ [ ]

A) $\begin{pmatrix} 0 & 2 & 0 \\ 2 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix}$ B) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 4 \end{pmatrix}$ C) $\begin{pmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{pmatrix}$ D) $\begin{pmatrix} 2 & 0 & 2 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{pmatrix}$

328. Let A = $\begin{pmatrix} 5 & x \\ y & 0 \end{pmatrix}$ and $A = A^T$ then [ ]

A) x = 0, y = 5 B) x+y = 5 C) x = y D) x = -y

329. $(A^T B^T)^T$ = [ ]

A) AB B) BA C) $A^T B^T$ D) $AB^T$

330. If $A = \begin{pmatrix} a & h & g \\ h & b & f \\ g & f & e \end{pmatrix}$, then A is [ ]

A) a nilpotent B) an in voluntary C) a symmetric D)an idempotent

331. $A = \begin{pmatrix} x & -7 \\ 7 & y \end{pmatrix}$ is a skew-symmetric matrix, then (x, y) = [ ]

A) (1, -1) B) (7, -7) C) (0, 0) D) (14, -14)

332. If A, B are symmetric matrices of the same order then AB - BA is [ ]

A) symmetric matrix B) skew symmetric matrix

C) Diagonal matrix D) identity matrix

333. If $A = \begin{pmatrix} x & 1 & 4 \\ -1 & 0 & 7 \\ -4 & -7 & 0 \end{pmatrix}$ such that $A^T = -A$ then x = [ ]

A) –1 B) 0 C) 1 D) 4

**MATHEMATICS (X CLASS)**

## STATEMENTS AND SETS

1. The negation of 4x2=7 is [ ]
   A) 4x2=8 B) $4 \div 2=7$ C) $4x2 \neq 7$ D) None of these
2. $(A \cap B) \cup (A \cap C)$ = ___ [ ]
   A) $A \cup (B \cap C)$ B) $A \cup (B \cup C)$ C) $A \cap (B \cap C)$ D) $A \cap (B \cup C)$
3. The existential quantifier is denoted by the symbol. [ ]
   A) $\subset$ B) $\in$ C) $\cap$ D)
4. $(A \cup B)'$ = [ ]
   A) $A' \cup B'$ B) $A' \cap B'$ C) $A \cup B$ D) $A \cap B$
5. If $A \subset B$, then $A \cap B$ = [ ]
   A) A B) B C) $A \cup B$ D) $A \cap B$
6. $\sim (p \Rightarrow q)$ = [ ]
   A) $p \vee (\sim q)$ B) $(\sim p) \vee q$ C) $p \wedge (\sim q)$ D) $(\sim p) \wedge q$
7. If n(A) = 6 ; n (B) = 8 ; n $(A \cup B)$=12, find n$(A \cap B)$ = [ ]
   A) 6 B) 2 C) 8 D) 12
8. $\sim [p \wedge (\sim q)]$ = [ ]
   A) $\sim \wedge p \sim q$ B) $\sim p \vee \sim q$ C) $\sim p \wedge q$ D) $\sim p \vee q$
9. $p \Rightarrow q \equiv$ [ ]
   A) $q \Rightarrow p$ B) $\sim q \Rightarrow \sim p$ C) $\sim p \Rightarrow \sim q$ D) $p \wedge \sim q$
10. $p \vee (q \wedge r) \equiv (p \vee q) \wedge (p \vee r)$ *is* [ ]
    A) Commutative law B) Distributive law
    C) Identity law D) De Morgan's law
11. If $A \subset B$, then $A \cap B$ = [ ]
    A) A B) B C) $\mu$ D) $\phi$
12. If $A \subset B$, then $A \cap B$ = [ ]
    A) A B) B C) $A \cup B$ D) $A \cap B$
13. An example of tautology. [ ]
    A) $p \wedge \sim p$ B) $p \vee \sim p$ C) $\sim p \Rightarrow p$ D) $\sim q \Rightarrow p$
14. If $p \subset \mu, q \subset \mu$ *then* $(p \cap q)^1$ = [ ]
    A) $p' \cap q'$ B) $p \cup q'$ C) $p' \cup q'$ D) None of these
15. $A \subset B$, n(A)=12 and n (B)=20, then n(B-A) = [ ]
    A) 32 B) –8 C) 8 D) –32
16. $(A \cup B \cup C)'$ = [ ]
    A) $A' \cup B' \cup C'$ B) $A' \cap B' \cap C'$ C) $A' \cup B' \cap C'$ D) $A' \cap B' \cup C'$
17. Which of the biconditional statements is true? [ ]
    A) $4x7=28 \Leftrightarrow 4 \div 7=1$ B) $4x7=20 \Leftrightarrow 4-7=3$
    C) $4+7=10 \Leftrightarrow 4-7=-3$ D) $4>7 \Leftrightarrow 4+7=11$
18. If A = [1, 2} ; B = [4, 5] ; C = [6, 7], then the number of elements in $A \times (B \cap C)$ is [ ]
    A) 8 B) 2 C) 0 D) $\phi$
19. If $A \subset B$, then A – B = [ ]
    A) $\mu$ B) $\phi$ C) A D) None
20. $(A \cup B)'$ = [ ]
    A) $A' \cup B'$ B) $A \cup B$ C) $A' \cap B'$ D) $A \cap B$
21. In the following, which is true? [ ]
    A) $3+7=10 \Leftrightarrow 1+2=2$ B) $3x7=10 \Leftrightarrow 1x3=3$
    C) $3+7=10 \Leftrightarrow 1+2=3$ D) $3x7=8 \Leftrightarrow 1x2=2$
22. The statement $5 \neq 4$ in the symbolic form [ ]
    A) $5 \vee 4$ B) $5 \wedge 4$ C) $\sim (5 \neq 4)$ D) $\sim (5 = 4)$

23. $p \Rightarrow q$ is F only when [ ]
A) p is f, q is T B) p is F, q is F C) p is T, q is F D) p is T, q is T

24. Suppose the truth value of "$p \Rightarrow q$" is F. Then which of the following is T? [ ]
A) p is T, q is T B) p is T, q is F C) p is F, q is T D) p is F, q is F

25. Contrapositive of $\sim p \Rightarrow q$ [ ]
A) $p \Rightarrow q$ B) $p \Rightarrow q \sim q$ C) $q \Rightarrow p$ D) $\sim q \Rightarrow p$

26. $\sim (p \Rightarrow q)$ = [ ]
A) $p \vee (\sim q)$ B) $(\sim p) \vee q$ C) $p \wedge (\sim q)$ D) $\sim p(\wedge q)$

27. $\sim (p \Leftrightarrow q)$ = [ ]
A) $p \Leftrightarrow (\sim q)$ B) $p \wedge q$ C) $\sim p \Leftrightarrow \sim q$ D) $p \wedge \sim q$

28. Which of the following statements is not true? [ ]
A) $\sim (p \vee q) = \sim p \wedge \sim q$ B) $\sim (p \Rightarrow q) = p \wedge \sim q$
C) $\sim (p \Leftrightarrow q) = p \Leftrightarrow \sim q$ D) $\sim (p \wedge q) = \sim p \wedge \sim q$

29. $A \cup A^1$ = _____ [ ]
A) $\forall$ B) $\phi$ C) 0 D) $\mu$

30. $\mu'$ = ____ [ ]
A) $\mu$ B) $\phi$ C) A D) None

31. $A = \{x : x \leq 4, x \in N\}$ : B = {2, 3, 6, 8} $A \cap B'$ = [ ]
A) {2, 3} B) {1, 4} C) {1, 2, 3, 4} D) { }

32. Aand B are disjoint sets. If n(A)=4 ; $n(A \cup B)$=10 then n(B) = [ ]
A) 5 B) 4 C) 6 D) 14

33. If n(A)=20 : n(B)=44; $n(A \cap B)$=13 then $n(A \cup B)$ = [ ]
A) 22 B) 24 C) 39 D) 51

34. If n(A)=6; n(B)=8 ; $n(A \cup B)$ =12 then $n(A \cap B)$ = [ ]
A) 6 B) 2 C) 8 D) 12

35. A-B' = _____ [ ]
A) $A \cap B$ B) B-A C) A'-B D) A-B

36. P, Q are two sets such that $P \cap Q = \phi$ ; then [ ]
A) $P \subset Q$ B) $Q \supset P$ C) $P \neq Q$ D) None

37. With reference to $A \subseteq B$ which of the following is true? [ ]
A) $n(A) \geq n(B)$ B) n(A)=n(B) C) $n(A) \leq n(B)$ D) None

38. $\sim (p \vee q) \equiv (\sim p) \wedge (\sim p)$ [ ]
A) Commutative law B) Distributive law
C) Identify law D) De Morgan's law

## KEY - SSTATEMENTS AND SETS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) C | 2) D | 3) D | 4) B | 5) A | 6) C | 7) B | 8) D |
| 9) B | 10) B | 11) A | 12) A | 13) B | 14) C | 15) C | 16) B |
| 17) B | 18) D | 19) B | 20) C | 21) C | 22) C | 23) C | 24) C |
| 25) D | 26) C | 27) A | 28) C | 29) D | 30) B | 31) D | 32) C |
| 33) D | 34) B | 35) A | 36) C | 37) C | 38) D | | |

## FUNCTIONS

1. $f=\{(x,3)/x\in N\}$ is a _____ function. [ ]

   A) One to one B) Onto C) Constant D) Identify

2. If f(x)=2x+3, then f(-3) = [ ]

   A) 2 B) 3 C) –3 D) –9

3. If A = {3, 4}, B = {4, 5}, then n(AxB) = [ ]

   A) 3 B) 4 C) 12 D) 20

4. Example for an ordered pair : [ ]

   A) {1,2} B) (1,2) C) {(1,2)} D) (12)

5. If $f(x)=x^2+4x-12$, what are the zeros of f? [ ]

   A) {-6, 2} B) {6, 2} C) {3, 2} D) {-3, -2}

6. If I(x)=x ; $\forall\ x\in A$ then I is : [ ]

   A) One to one function B) Identity function

   C) Onto function D) Constant function

7. If $f(x) = x^2+x+4$, then 24 is the image of [ ]

   A) 1 B) 2 C) 3 D) 4

8. If f : R → R, f(x)=3x+2, then $f^{-1}$ (x) is equal to [ ]

   A) 3x-2 B) 2x+3 C) $\frac{x-2}{3}$ D) 2x-3

9. If $f(x)=x^2-5x+6$, then the value of f(-1) [ ]

   A) 0 B) 12 C) 2 D) 16

10. f is bijection mean it is [ ]

    A) One to one and constant B) Into and one to one

    C) Onto and into D) One to one and onto

11. If $f(x)=x^2-3x+2$, then f(-2) = [ ]

    A) 12 B) 4 C) –12 D) 0

12. f(x) = 2x-3. Then zero of the function is [ ]

    A) $\frac{2}{3}$ B) $\frac{3}{2}$ C) 0 D) $-\frac{3}{2}$

13. f : N → N, f(x) = x+1. Then range of 'f' is [ ]

    A) {0, 1, 2} B) {2, 3, 4} C) {1, 2, 3 ....} D) {4, 5, 6}

14. Let f : A → B be a function. The condition for $f^{-1}$ : B → A to be a function is : [ ]

    A) f must be one – one B) f must be onto

    C) f must be one one and onto D) f must be constant

15. If A = {1, 2} ; B = {4, 5} ; C = {6, 7}, then the number of elements in A x (B ∩ C) is [ ]

    A) 8 B) 2 C) 0 D) $\phi$

16. If 'f' is a function from A to B, then f is a subset of : [ ]

A) A×B B) A×A C) B×A D) f(a)

17. If f = {(x, a), (y,b), (z,c)} and $f^{-1}$=g, then $g^{-1}$ = [ ]

A) {(x,x), (y,y), (z,z)} B) {(a,x), (b,y), (c,z)}

C) {a, b, c} D) {(x,a), (y,b), (z,c)}

18. f : A → B is a bijective and if n(A)=4 then n(B) = [ ]

A) 1 B) 2 C) 3 D) 4

19. $f(x) = x^2+2x-k$ and if f(2)=8 ; then k = [ ]

A) 1 B) 2 C) 0 D) 3

20. The zero value of the given function is _____ [ ]

A) 0 B) –2 C) 2 D) 0, ±2

21. Example for an ordered pair [ ]

A) {1, 2} B) (1, 2) C) {(1, 2)} D) (12)

22. If (a+b, 1) = (5, a-b) then 2a+3b = _____ [ ]

A) 5 B) 12 C) 8 D) 6

23. If $f(x)=x^2-x+6$ then f(4) = [ ]

A) 0 B) 18 C) 6 D) 2

24. One-one function among the following functions is [ ]

A) when f : R → R is defined by $f(x)=x^2+1$

B) when f : R → R is defined $f(x)=x^2$

C) when f : R → R is defined by $f(x)=x^3$ D) None

25. If f : R → R : f(x) = 3x+2 ; then $f^{-1}$ (x) is equal to [ ]

A) 3x-2 B) 2x+3 C) $\frac{x-2}{3}$ D) 2x-3

26. If f: A → B and g : B → C then [ ]

A) gof : A → C B) gof : C → A C) gof : A → B D) gof : B → A

27. If f(x)=22-x and g(x)=3x+2 ; then fog (2) = _____ [ ]

A) 4+2x B) –4x C) 2 D) –6

## KEY - FUNCTIONS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) C | 2) C | 3) B | 4) B | 5) A | 6) B | 7) D | 8) C |
| 9) B | 10) D | 11) A | 12) B | 13) B | 14) C | 15) C | 16) A |
| 17) D | 18) D | 19) B | 20) A | 21) B | 22) B | 23) B | 24) C |
| 25) C | 26) A | 27) A | | | | | |

## POLYNOMIALS OVER INTEGERS

1. The sum of the roots of $2x^2+5x-7=0$ [ ]

   A) $\frac{5}{2}$ B) $\frac{2}{5}$ C) $-\frac{5}{2}$ D) $-\frac{2}{5}$

2. The value of k if (x-1) is a factor of $2x^3-5x^2+kx+7$ is [ ]

   A) 0 B) 4 C) –4 D) 14

3. The curves of the graph of $x=my^2$ (m>0) lie in the quadrants [ ]

   A) 1 and 2 B)1 and 3 C) 1 and 4 D) 2 and 4

4. In the expansion of $\left(\frac{x}{y}+\frac{y}{x}\right)^8$ the middle term is [ ]

   A) $8_{C_4}$ B) $8_{C_5}$ C) $8_{C_3}$ D) $8_{C_6}$

5. If the roots of the equation $px^2+qx+r=0$ are equal, then [ ]

   A) $q^2 = pr$ B) $q^2 = 4pr$ C) $p^2=4pr$ D) p=qr

6. The sum of the roots of $3x^2-5x+9=0$ is [ ]

   A) 3 B) $\frac{5}{3}$ C) 9 D) $-\frac{5}{3}$

7. If $\sqrt{x+1}=3,\ x=$ [ ]

   A) 8 B) 6 C) 9 D) 10

8. Inequation having solution "$-3 \le x \le 4$". [ ]

   A) $x^2+x-12 \le 0$ B) $x^2-x+12 \le 0$ C) $x^2-x-12 \le 0$ D) $x^2+x+12 \le 0$

9. Remainder when ax + b divides f (x) is [ ]

   A) $f\left(\frac{a}{b}\right)$ B) $f\left(\frac{a}{b}\right)$ C) $f\left(-\frac{a}{b}\right)$ D) $f\left(-\frac{b}{a}\right)$

10. The discriminant of the quadratic equation $2x^2-7x+3=0$ is [ ]

    A) 20 B) 24 C) 25 D) 26

11. The remainder, when f(x) is divided by (ax-b) [ ]

    A) $f\left(-\frac{a}{b}\right)$ B) $f\left(\frac{a}{b}\right)$ C) $f\left(\frac{a}{b}\right)$ D) $f\left(-\frac{a}{b}\right)$

12. Sum of the binomial coefficients of the expansion of $\left(\frac{x}{y}+\frac{y}{x}\right)^4$ is [ ]

    A) 6 B) 16 C) 4 D) 32

13. If $n_{C_8}$ - $n_{C_7}$ then n = [ ]

    A) 15 B) 56 C) 1 D) 0

14. If x + 1 is a factor of ax2+bx+c, then [ ]

    A) a+b+c=0 B) a+b=c C) a+c=b D) b+c=a

15. $6_{C_4}$ [ ]

A) 15 B) 20 C) 6 D) 4

16. If $x^2-5x+4<0$, then x lies between [ ]

A) 1 and 4 B) 1 and 5 C) 2 and 3 D) 2 and 5

17. In a Pascal triangle each row of coefficients is bounded on both sides by [ ]

A) 0 B) 2 C) 3 D) 1

18. In the expansion of $\left(x-\frac{1}{x}\right)^9$, which term contains $x^5$? [ ]

A) 3 B) 4 C) 5 D) 6

19. If (x) = $x^2+2x-k$ and if f(2)=8, then k = [ ]

A) 1 B) 2 C) 0 D) 3

20. If (x-y) is a factor of $x^n-y^n$, then 'n' is [ ]

A) Any natural number B) Old number

C) Even number D) Prime number

21. If the roots of the equation $px^2+qx+r=0$ are equal, then [ ]

A) $q^2=pr$ B) $p^2=4pq$ C) $q^2=4pr$ D) $r^2=pr$

22. If $x^2-x-2< 0$ then the value of x [ ]

A) Lies between – 1. 2 B) Does not lie between –1, 2

C) Lies between 1, –2 D) Does not lie between 1, –2

23. If the discriminant $(\Delta)$ of a quadratic equation $ax^2 + bx + c = 0$ is zero, then the parabola $y = ax^2 + bx + c$ intersects x – axis. [ ]

A) In two distinct points B) In only one point

C) In no print D) None

24. The discriminant of a quadratic equation is negative, then the roots are [ ]

A) Imaginary B) Real C) Equal D) None of these

25. If $x^3-3x^2+4x-5$ is divided by (x+1), then remainder is [ ]

A) 0 B) 13 C) –13 D) None

26. If $f\left(\frac{b}{a}\right)=0$, then the factor of f(x) is [ ]

A) ax+b B) ax-b C) bx+a D) bx-a

27. If f(x) = $a_0x^n+a_1x^{n-1}+a_2x^{n-2}$ ..... + $a_n$ and $a_1 + a_2 + a_3$ ..... $a_n=0$ then ..... is a factor of f(x). [ ]

A) (x+1) B) (x-1) C) (x+1) and (x-1) D) None

28. (x+1) is a factor to $ax^4 + bx^3 + cx^2 + dx + c$. Then which of the following is true? [ ]

A) a+c+e=b+d B) a+b+c=0 C) a+b+c+d+e=0 D) a+b+c=d+e

29. If (x+1) is a factor of $ax^2+bx+c$ ; then [ ]

A) a+b+c=0 B) a+b+c=0 C) a+c=b D) b+c=a

30. The curve $x=my^2$ $(m>0)$ lies in _____ quadrants. [ ]

A) 1 and 2 B) 1 and 3 C) 1 and 4 D) 2 and 4

31. The solution set which satisfied the quadratic equation $x^2-4x3=0$ [ ]

A) (1,4) B) (1, -4) C) (1, 3) D) (-4, 3)

32. If $x^2 - x - 6 < 0$, then the value of x ..... [ ]

A) Lies between – 3 and 2 B) Lies between 3 and –2

C) Does not lie between –3 and 2 D) Does not lie between 3 and –2

33. The inequation with the solution set $1 < x < 3$ is [ ]

A) $x^2 + 4x + 3 > 0$ B) $x^2 - 4x + 3 < 0$

C) $x^2 - 4x - 3 < 0$ D) $x^2 - 4x + 4 > 0$

34. The quadratic inequation satisfying the inequation $1 < x < 5$ [ ]

A) $x^2 - 5x + 6 < 0$ B) $x^2 - 6x + 5 < 0$

C) $x^2 - 5x + 6 > 0$ D) $x^2 - 6x + 5 > 0$

35. In the expansion of $\left(2x+\frac{1}{3x}\right), \frac{8}{3}$ is the coefficient of ____ [ ]

A) $x^3$ B) $x^2$ C) $x$ D) $x^0$

36. Last term in the expansion of $\left[x+\frac{2}{x}\right]^5$ is [ ]

A) $\frac{2}{x^5}$ B) $\frac{10}{x^5}$ C) $\frac{3^2}{x^5}$ D) $\frac{32}{x^5}$

37. What is the remainder when $3x^2 - 5x + 6$ is divided by $(x - 2)$? [ ]

A)8 B)-4 C)28 D) 32

38. What is the remainder when $5x^2 + 3x - 7$ is divided by $x + 9$? [ ]

A) 439 B) 425 C) 385 D) 371

39. What is the remainder when $2x^2 - 3x + 5$ is divided by $2x - 1$? [ ]

A) 2 B) 3 C) 4 D) 5

40. What is the remainder when $3x^2 + 6x - 4$ is divided by $5x + 2$? [ ]

A) -5.92 B) -1.12 C) 1.12 D) 5.92

41. Which of the following is a factor of $2x^3 - x^2 - 21x + 18$? [ ]

A) x – 1 B) x – 2 C) x – 3 D) x - 4

42. Which of the following is a root of $3x^4 + 6x^3 - 4x^2 - 6x + 4$? [ ]

A) 0 B)1 C) -1 D) -2

43. Which of the following is a root of $x^5 - 2x^4 - 9x^3 + 17x^2 - x + 6$? [ ]

A) -4 B)-3 C) 3 D) 4

44. Which of the following is a factor of $6x^3 + 5x^2 - 2x - 1$? [ ]

A) x – 1 B) 2x – 1 C) 3x – 1 D) 4x – 1

45. If -4 is a root of $x^4 + ax^3 - 19x^2 - 46x + 120$ . What is the value of a? [ ]

A) a = 1 B) a = 2 C) a = 3 D) a = 4

46. If 2 is a root of $kx^4 - 11x^3 + kx^2 + 13x + 2$. What is the value of k? [ ]

A) k = 1 B) k = 2 C) k = 3 D) k – 4

## KEY - POLYNOMIALS OVER INTEGERS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) C | 2) C | 3) C | 4) A | 5) B | 6) B | 7) A | 8) C |
| 9) D | 10) C | 11) A | 12) B | 13) A | 14) C | 15) A | 16) A |
| 17) D | 18) A | 19) C | 20) A | 21) C | 22) A | 23) B | 24) A |
| 25) C | 26) B | 27) B | 28) A | 29) C | 30) C | 31) C | 32) B |
| 33) B | 34) B | 35) A | 36) D | 37) A | 38) D | 39) D | 40) A |
| 41) C | 42) D | 43) C | 44) A | 45) D | 46) C | | |

## LINEAR PROGRAMMING

1. If P(x, y) is in $Q_2$ : [ ]

   A) x > 0 ; y > 0 B) x < 0 ; y > 0 C) x < 0 ; y < 0 D) x > 0 ; y <0

2. The point that relates to 2x – y > 0 [ ]

   A) (4, 8) B) (2, 3) C) (0, 0) D) (1, 2)

3. The point that lies in the half plane x+y<3 is [ ]

   A) (1,1) B) (2,2) C) (3,3) D) (4,4)

4. (If x > 0, y < 0, then the point (x, y) lies in the quadrant : [ ]

   A) $Q_1$ B) $Q_2$ C) $Q_3$ D) $Q_4$

5. Find the point minimizing "C", if C = 20x + 25y [ ]

   A) (100,0) B) (0,100) C) (10,20) D) (50,60)

6. If $x+2y \leq 4$ then find the point which satisfied this inequation. [ ]

   A) (2,1) B) (3,1) C) (3,2) D) (3,4)

7. The point which belongs to 2x-3y>0 is [ ]

   A) (3,2) B) (2,3) C) (-3,-2) D) (3,-2)

8. The point which satisfied the shaded region of 3x-4y+12>0 [ ]

   A) (4,1) B) (0,4) C) (1,4) D) (0,5)

9. Which of the following points does not lie in the half-plane show by x+y+<3? [ ]

   A) (0,0) B) (2,0) C) (2,1) D) (1,0)

10. The distance between $(x_1, y_1)$ and $(x_2, y_2)$ is [ ]

   A) $\sqrt{(x_1+x_2)^2+(y_1+y_2)^2}$ B) $\frac{x_1^2+y_1^2}{2}$

   C) $\sqrt{x_2^2+y_2^2}$ D) $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

11. The point which satisfy the inequation x-y=1>0 is [ ]

   A) (3,5) B) (-3,5) C) (-1,2) D) (1,2)

12. If $x > 0$, $y < 0$ then the point (x, y) lies in the quadrant. [ ]

A) $Q_1$ B) $Q_2$ C) $Q_3$ D) $Q_4$

13. The point does not belong to $x-y+2 \leq 0$ is [ ]

A) (2,3) B) (-3,5) C) (0,6) D) (-2,1)

14. The point which does not lie in the region $2x-3y>5$ [ ]

A) (1,1) B) (3,-3) C) (-2,-4) D) (1,-4)

15. The point which does not satisfy the inequation $3x+y>6$ is [ ]

A) (1,0) B) (2,3) C) (3,2) D) (6,0)

16. The point that belongs to the region of "$x+3y<-5$" is [ ]

A) (2,1) B) (-2,-1) C) (-3,1) D) (-3,-1)

17. Which of the following inequations represents the region containing the point (1,2) [ ]

A) $x-y>2$ B) $x+ y < 5$ C) $2x+y>6$ D) $x-2y<7$

18. The inequation that represents the region containing the points (1,2) and (2,1) [ ]

A) $x+y <2$ B) $x+y >5$ C) $2x+y<6$ D) $x+2y>7$

19. $F=2x+3y$ is maximum at the point. [ ]

A) (5,6) B) (6,-5) C) (-2,-6) D) (-1,-3)

20. The point which does not belong to $x - y + 2 \leq 0$ is [ ]

A) (2, 3) B) (-3, 5) C) (0, 6) D) (-2, 1)

## KEY - LINEAR PROGRAMMING

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) B | 2) B | 3) A | 4) D | 5) C | 6) A | 7) D | 8) A |
| 9) C | 10) D | 11) A | 12) D | 13) A | 14) A | 15) A | 16) D |
| 17) D | 18) C | 19) A | 20) A | | | | |

## REAL NUMBERS

1. $16^{1.25}$ = [ ]

A) 32 B) 64 C) 16 D) $\frac{5}{4}$

2. $\lim\limits_{x \to a} \frac{x^m - a^m}{x^n - a^n}$ = [ ]

A) $m.\ a^{m-1}$ B) $n.\ a^{n-1}$ C) $\frac{m}{n}a^{m-n}$ D) $\frac{n}{m}a^{n-m}$

3. If $\sqrt[3]{x} + \sqrt[3]{y} + \sqrt[3]{z} = 0$ then $(x+y+z)^3$ = [ ]

A) 3 xyz B) 9 xyz C) 27 xyz D) $(3\ xyz)^{1/3}$

4. $6^{-3} \times 6^3$ = [ ]

A) $36^{-9}$ B) 1 C) $6^{-3/3}$ D) 0

5. If $x^{1/2} = 0.2$ then $x^{3/2}$ = [ ]

A) 0.6 B) 0.8 C) 0.008 D) 0.08

6. If $\sqrt{2^x} = 16$ then x = [ ]
   A) 8 B) 4 C) 2 D) 10

7. If $\sqrt{x+1} = 3$, $x$ = [ ]
   A) 8 B) 6 C) 9 D) 10

8. If $\sqrt{\sqrt{3^x}} = 81$ then x = [ ]
   A) 16 B) 8 C) 4 D) 2

9. If $a^{x-1} = bc$ ; $by^{-1} = ca$ ; $c^{z-1} = ab$ ; then xy + zx = [ ]
   A) x+y+z B) xyz C) 1 D) 0

10. $2^{x+3} = 4^{x+1}$, then x = [ ]
   A) 4 B) 3 C) 2 D) 1

11. If $7^{x+3}=5^{x+3}$, then the value of x is [ ]
   A) 0 B) 1 C) 3 D) -3

12. $(32)^{-4/5}$ = [ ]
   A) $\frac{1}{2}$ B) $\frac{1}{16}$ C) 16 D) 5

13. $\lim_{x\to a} \frac{x^{\frac{3}{2}} - a^{\frac{3}{2}}}{x-z}$ = [ ]
   A) $\frac{3}{2}a$ B) $\frac{3}{2}\sqrt{a}$ C) $\frac{3}{2}a^2$ D) $\frac{3}{2a}$

14. If $a^2=0.04$ then $a^3$ = [ ]
   A) 0.8 B) 0.08 C) 0.008 D) 0.0008

15. $16^{0.5}$ = [ ]
   A) 5.43 B) 45 C) 8 D) 4

16. $|x| \le a \Rightarrow$ [ ]
   A) $-a \le x \le a$ B) $-a < x < a$ C) $-a \ge x \ge a$ D) x > a (or) x < a

17. $|x+1| < 6$ then 'x' [ ]
   A) {x / -7 < x < 5} B) {x / -7 < x ≤5} C) {x/-7 ≤x<5 D) {x/-7 ≤x ≤5

18. $\lim_{x\to 2} \frac{x^3-8}{x^3-2}$ = = _____ [ ]
   A) 12 B) 13 C) 16 D) 18

19. $\lim_{x\to 0} \frac{(1+x)^{\frac{1}{n}} - 1}{x}$ = _____ [ ]
   A) n B) $\frac{1}{n}$ C) $n^2$ D) $\frac{1}{n^2}$

20. $\lim_{x\to 0}$ Sin x = [ ]
   A) 1 B) 2 C) -1 D) 0

21. $\underset{x\to 0}{Lt}$ Cos x = [ ]

A) 0 B) 1 C) 2 D) -1

22. $\underset{x\to 0}{Lt}\ \frac{Sin\,x}{x}$ = [ ]

A) 1 B) 2 C) 0 D) None

23. $\underset{x\to 0}{Lt}\ \frac{\tan x}{x}$ = [ ]

A) 0 B) 1 C) -1 D) $\infty$

24. $\underset{x\to -3}{Lt}\ \frac{1}{x+2}$ = [ ]

A) 1 B) 2 C) 0 D) -1

25. $\underset{x\to 1}{Lt}$ (x+2) (2x+1) = [ ]

A) 7 B) 8 C) 9 D) None

26. $\underset{x\to 3}{Lt}\ \frac{x^2+2x-5}{2x^2-5x+1}$ = [ ]

A) 5/2 B) 3/2 C) 7/2 D) None

27. $\underset{x\to 2}{Lt}\ \frac{x^2+2x-1}{x^2-4x+4}$ = [ ]

A) 0 B) 1 C) 2 D) $\infty$

28. $\underset{x\to 2}{Lt}\ \frac{x^2-5x+1}{x^2-x-2}$ = [ ]

A) 1/3 B) –1/3 C) 2/3 D) 0

29. $\underset{x\to 0}{Lt}\ \frac{1}{x^2-3x+2}$ = [ ]

A) 1 B) 1/3 C) ½ D) 0

30. $\underset{x\to 0}{Lt}\ e^x$ [ ]

A) 0 B) 1 C) $\ell$ D) None

31. $\underset{x\to \infty}{Lt}\ \frac{x^2+5x+2}{2x^2-5x+1}$ [ ]

A) 1 B) 0 C) $\infty$ D) 1/2

32. $\underset{x\to \infty}{Lt}\ \frac{11x^3-3x+4}{13x^3-5x^2-7}$ = [ ]

A) 13/11 B) 11/13 C) 3/5 D) None

33. $\underset{x\to 0}{Lt}\ \frac{(1+x)^{\frac{3}{2}}-1}{x}=$ [ ]

A) 3 B) 1/2 C) 2 D) 4

34. $\underset{x\to 2}{Lt}\ \left[\frac{1}{x-2}-\frac{4}{x^2-4}\right]=$ [ ]

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 2 D) 4

35. $\underset{x\to 0}{Lt}\ \frac{\sqrt{1+x}-1}{x}=$ [ ]

A) 1 B) 3/2 C) 1/2 D) None

36. $\underset{x\to a}{Lt}\ \frac{\sqrt{x+a}-\sqrt{2a}}{x-a}=$ [ ]

A) $\frac{1}{\sqrt{2a}}$ B) $\frac{1}{2\sqrt{2a}}$ C) $\frac{1}{2\sqrt{a}}$ D) None

37. $\underset{x\to 2}{Lt}\left(3^{x^2-2x+1}\right)=$ [ ]

A) 2 B) 1 C) 9 D) 3

38. $\underset{x\to 0}{Lt}\ \frac{\sqrt[3]{1+x}-\sqrt[3]{1-x}}{x}=$ [ ]

A) 2/3 B) 1/3 C) $\sqrt[3]{3}$ D) $\sqrt{3}$

39. $\underset{x\to \infty}{Lt}\ \frac{1+2+3+----+n}{n^2}=$ [ ]

A) 0 B) 1 C) 1/2 D) 1/3

40. $\underset{x\to \infty}{Lt}\ \frac{1^2+2^2+3^2+----+n^2}{n^3}=$ [ ]

A) 3/2 B) 1/4 C) 1/2 D) 2

41. $\underset{x\to \infty}{Lt}\ \frac{1^3+2^3+3^3+----+n^3}{n^4}=$ [ ]

A) 1/2 B) 1/3 C) 1/4 D) None

42. $\underset{x\to \infty}{Lt}\left(\frac{1}{2^x}\right)$ [ ]

A) 0 B) 1 C) 2 D) $\infty$

43. $\underset{x\to 0}{Lt}\ \frac{|x|}{x}=$ [ ]

A) ±1 B) 0 C) x D) not defined

44. $\lim_{x\to 2}(3x^2-5x+7) =$ [ ]

A) 8 B) 9 C) 10 D) 11

## KEY - REAL NUMBERS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) A | 2) C | 3) C | 4) B | 5) C | 6) A | 7) A | 8) A |
| 9) B | 10) D | 11) D | 12) B | 13) B | 14) C | 15) D | 16) A |
| 17) A | 18) A | 19) B | 20) D | 21) B | 22) A | 23) B | 24) D |
| 25) C | 26) A | 27) D | 28) B | 29) C | 30) B | 31) D | 32) B |
| 33) A | 34) A | 35) C | 36) B | 37) D | 38) B | 39) C | 40) A |
| 41) C | 42) A | 43) A | 44) B | | | | |

## PROGRESSIONS

1. If A, G, H are Arithmetic mean, Geometric mean an harmonic mean, then the relation among them is ____- [ ]

   A) $A^2=G.H$ B) $G^2=A.H$ C) $H^2=A.G$ D) G=A.H

2. The sum of n terms of the series 1 + 4 + 9 + 16 + …… = [ ]

   A) $\frac{n(n+1)}{2}$ B) $\frac{(n+1)\,(2n+1)}{6}$ C) $\frac{n(n+1)\,(2n+1)}{6}$ D) $\frac{n2(n+1)^2}{4}$

3. The relation between A.M., G.M and H.M is [ ]

   A) $A^2=G.H$ B) $G^2=A.H$ C) $H^2=A.G$ D) AG=H

4. Find 'r' in the G.P. : $1-\frac{1}{3}+\frac{1}{9}-\frac{1}{27}+$ ..... [ ]

   A) $\frac{1}{3}$ B) 3 C) $-\frac{1}{3}$ D) -3

5. Harmonic mean between a, b is [ ]

   A) $\frac{a+b}{2}$ B) $\frac{a-b}{2}$ C) $\frac{2ab}{a+b}$ D) $\sqrt{ab}$

6. If there are "n" Arithmetic means between and b, then d = [ ]

   A) $\frac{a-b}{n+1}$ B) $\frac{b-a}{n+1}$ C) $\frac{a+b}{n-1}$ D) $\frac{b-a}{n-1}$

7. If arithmetic mean and geometric mean of two numbers are 16 and 8, then their harmonic means is [ ]

   A) 4 B) 12 C) 32 D) 64

8. Geometric mean of 5 and 125 [ ]

   A) 60 B) 65 C) 25 D) 625

9. If tan A, tan B, tan C are n A.P., then Cot A, Cot B, Cot C are in [ ]

A) Arithmetic progression B) Geometric progression

C) Harmonic progression D) None

10. If $\sum n = 10$, then $\sum n^3 =$ [ ]

A) 1000 B) 100 C) 10 D) 1

11. If $2, \sqrt{8}, 4$ ..... are in G.P. then common ratio is [ ]

A) $\sqrt{8}$ B) $\sqrt{2}$ C) $4\sqrt{2}$ D) $2\sqrt{2}$

12. In the following which is not correct? [ ]

A) $\sum n = \frac{n(n+1)}{2}$ B) $\sum n^2 = \frac{n(n+1)(2n+1)}{36}$ C) $\sum n^3 = \frac{n^2(n+1)^2}{4}$ D) $\sum 1 = n$

13. The first term of a G.P is 50 ; and the $4^{th}$ term is 1350 ; then the $5^{th}$ term is [ ]

A) 8050 B) 5050 C) 4050 D) 6050

14. The 'n' th term of the progression 2.3+3.4+4.5+ ..... is [ ]

A) n(n+1)B) (n+1) (n+2) C) n(n-1) D) (n-1) (n+1)

15. The nth term of An A.P. is 2n+5 ; then the common difference (d) is [ ]

A) 1 B) 2 C) 3 D) 4

16. 1, 2, 3, 4 ..... sum to 10 terms is [ ]

A) 5050 B) 505 C) 55 D) 50

17. If a, b are in A.P. then c+a = ____ [ ]

A) b B) 2b C) 3b D) 4b

18. Sum of the cubes o the first five natural numbers in [ ]

A) 15 B) 225 C) 55 D) 125

19. 1.3+3.5+5.7+ ..... in this series nth term is [ ]

A) $4n^2+1$ B) $4n^2-1$ C) $1-4n^2$ D) $n^2+4$

20. The common ratio of the G.P. $\frac{1}{2}, \frac{-1}{4}, \frac{1}{8}, \frac{-1}{16}$ ..... *is* [ ]

A) $-\frac{1}{2}$ B) $\frac{1}{2}$ C) 2 D) –2

21. $7^{th}$ term of the following series 1, $\frac{-1}{2}, \frac{1}{4}$ ..... is [ ]

A) $-\frac{1}{8}$ B) $\frac{1}{16}$ C) $-\frac{1}{32}$ D) $\frac{1}{64}$

22. Multiple of 9 between 1 and 1000 is [ ]

A) 100 B) 110 C) 111 D) 99

23. If $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in H.P. then [ ]

A) b= $\frac{2ac}{a+c}$ B) $b-\sqrt{ac}$ C) $b = \frac{a^2-c^2}{4}$ D) C = 2b-a

24. First term of an A.P is 'a' ; cd is 'd' then $15^{th}$ term of H.P is [ ]

A) $\frac{1}{a+15d}$ B) $\frac{1}{a-15d}$ C) $\frac{1}{a+14d}$ D) $\frac{1}{a-14d}$

25. If a, b, c are in G.P then [ ]

A) $a=bc$ B) $b^2=ac$ C) $c=ab$ D) $a^2=bc$

**26.** If $t_n = t_{n-1} + 2$ ; $n \geq 2$ and $t_1 = 1$, then sum of 4 terms of this series is [ ]

A) 15 B) 16 C) 35 D) 18

27. If $n^{th}$ term of a series $t_n = \frac{n(n-1)(n+5)}{(n-5)(n+2)(n-4)}$, *then* 13*th term is* ..... [ ]

A) $\frac{18}{7}$ B) $\frac{39}{15}$ C) $\frac{26}{9}$ D) None

28. Formula to find $n^{th}$ term of A.P. is [ ]

A) a+(n+1)d B) a-(n+1)d C) a+(n-1)d D) a-(n-1)d

29. If the sum of the n terms of the series 30, 25, 20 …. is 105, then n is .. [ ]

A) 5 B) 6 C) 9 D) 8

30. The common difference of the A.P., $\frac{1}{1+\sqrt{a}}, \frac{1}{1-a}, \frac{1}{1-\sqrt{a}}$ *is* [ ]

A) $\frac{a}{\sqrt{1-a}}$ B) $\frac{\sqrt{a}}{1-a}$ C) $\sqrt{\frac{a}{1-a}}$ D)None

31. The $n^{th}$ term of A.P. 3, -6, -15, ..... is [ ]

A) 3 + 9 (n-1) B) 3 – 9 (n+1) C) 3 – 9 (n-1 D) 3 + 9 (n+1)

32. If the first term of an A.P. is P, and common difference is S, then sum of n terms [ ]

A) $\frac{n}{2}[2P+(n-1)S]$ B) $\frac{n}{2}[2S+(n-1)P]$ C) $\frac{n}{2}[2P-(n+1)S]$ D) $\frac{n}{2}[2P+(n+1)S]$

33. Which of the following is A.P. ? [ ]

A) 1, 3, 5, 8, 11, …. B) 1, 2, 4, 8,.. C) $1^2, 2^2, 3^2$, … D) 10, 7, 4, ….

34. If $t_n = \frac{n^2}{(n+1)(n+2)}$, *then sum of the first two terms* = [ ]

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{6}$ D) $\frac{1}{3}$

35. The common difference of an A.P. is 4. If sum of 10 terms of that series is 200, then the first term of the series is [ ]

A) 4 B) 6 C) 2 D) 8

36. If the first term of an A.P. is 2 and sum of 18 terms is 180, then last term is [ ]

A) 22 B) 20 C) 18 D) 16

37. The common difference of the series $\frac{8}{3}, \frac{5}{3}, \frac{2}{3}$ ..... *is* ..... [ ]

A) 1 B) -1 C) 1/3 D) 3

38. First term of an A.P. is –1 and common difference is 3. Then sum of first 8 terms is [ ]

A) -184 B) -92 C) 184 D) 76

39. 7 times of the $7^{th}$ term of an A.P. is equal to 11 times to the $11^{th}$ term. Then $18^{th}$ term of the series is [ ]

A) 324 B) 642 C) 352 D) 0

40. Sum of three terms which are in A.P is 0. If the sum of the squares of the extremes is 128, find the first term. [ ]

A) 1 B) 8 C) -8 D) $\pm 8$

41. Sum of five terms of an A.P. is 80 and the difference of first and last terms is 16. Then the first and last terms of that series are .... [ ]

A) 8, 24 B) 16, 0 C) 32, 16 D) 48, 32

42. If a, b, c, d, e are in A.P. then a + e = [ ]

A) b + d B) b + c C) c + d D) None

43. If $p^{th}$, $q^{th}$ and $r^{th}$ terms of an A.P are P, Q and R respectively, then P (q-r) +Q(r-p)+ R (p-q) = [ ]

A)1 B) 0 C) P + Q + R D) PQ + QR

44. If the second term of an A.P. is 25 and $7^{th}$ term is 15, then the common difference is[ ]

A) 3 B) 2 C) -2 D) -3

45. If the $n^{th}$ term of an A.P. is $4n^2 + 5n$, then $3^{rd}$, $4^{th}$ and $5^{th}$ terms of that series are respectively [ ]

A) 9, 26, 61 B) 18, 25, 32 C) 51, 84, 125 D) 26, 51, 76

46. If $\frac{1}{b+c}, \frac{1}{c+a}$ *and* $\frac{1}{a+b}$ are in A.P. which of the following is in A.P? [ ]

A) a, b, c B) $\sqrt{a}, \sqrt{b}, \sqrt{c}$ C) $a^2, b^2, c^2$ D) $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$

47. $1^2 + 2^2 + 3^2 + \ldots\ldots + n^2 =$ [ ]

A) $\frac{n(n+1)(n-1)}{6}$ B) $\frac{n(n-2)\,(2n+1)}{6}$ C) $\frac{n(n+1)\,(2n+1)}{6}$ D) $\frac{n(n+1)\,(2n+1)}{3}$

48. If a = -1 and d = -3 of an A.P, then $8^{th}$ term of that series is …… [ ]

A) -20 B) 20 C) 21 D) -22

49. How many terms are to be added to make the sum 256 of the series 1+3+5+..+? [ ]

A) 14 B) 16 C) 18 D) 20

50. $1+2+3+4+\ldots\ldots+n =$ [ ]

A) $\frac{n+1}{2}$ B) $\frac{n-1}{2}$ C) $\frac{n(n+1)}{2}$ D) $\frac{n(n-1)}{2}$

**51.** If $t_{r-1}$ and $t_r$ are the two consecutive terms of a G.P. then $t_r / t_{r-1}$ [ ]

A)a B) r C) $t_n$ D) None

52. Which term is 1/9 in the G.P. 9 + 3 + 1 + ……. ? [ ]

A) $t_6$ B) $t_4$ C) $t_5$ D) $t_3$

53. In G.P $t_1 = \sqrt{3}, t_2 = \sqrt{6}$ *Then* $t_4$ = [ ]

A) $2\sqrt{6}$ B) $2\sqrt{3}$ C) $2\sqrt{12}$ D) $6\sqrt{12}$

54. The value of 'x' so that $-\frac{2}{7}x, -\frac{7}{2}$ are in G.P. is [ ]

A) 2/7 B) –7/2 C) $\pm 1$ D) $\pm$ 2

55. The $t_4$ of a G.P whose $t_n = 2(-3)^n$ is [ ]

A) -162 B) 162 C) -54 D) 54

56. The sum to 10 terms of the G.P. 1, 2/3, 4/9 …… is [ ]

A) $3\left(1-\frac{2^{10}}{3^{10}}\right)$ B) $3\left(1-\frac{3^{10}}{2^{10}}\right)$ C) $3\left(1-\frac{1}{3^{10}}\right)$ D) $\left(1+\frac{2^{10}}{3^{10}}\right)$

57. If the product of 3 numbers in a G.P is 729, then the middle term is [ ]

A) 7 B)3 C) 5 D)9

58. If $n^{th}$ term of a G.P whose first term is 'a' and common ratio is 'r' is [ ]

A) ar B) $ar^n$ C) $ar^{n-1}$ D) $ar^{n+1}$

59. The 3 rd term of a G.P whose first term is –5 and common ratio is –3 is [ ]

A)-45 B) -55 C) -135 D)None

60. Sum of 'n' terms of a G.P whose first term is 'a' and common ratio is 'r' is [ ]

A) $\frac{a(r^n+1)}{r-1}$ B) $\frac{a(r^n-1)}{1-r}$ C) $\frac{a(r^n-1)}{r-1}$ D)na

61. The sum of 5 terms of a G.P whose first term is –5 and common ratio is –3 is [ ]

A) -45 B)-55 C) -5 D)None

62. If a, b, c are in G.P, then $b^2$ = [ ]

A)ac B) $(ac)^2$ C) $\sqrt{ac}$ D)0

63. The Geometric Mean between 4 and 9 is [ ]

A)36 B) 14 C) $\pm 6$ D)1

64. If 'n' Geometric Means are inserted in between 'a' and 'b', then the common ratio 'r'= [ ]

A) $\sqrt[n]{\frac{b}{a}}$ B) $\sqrt[n+1]{\frac{b}{a}}$ C) $\frac{b}{a}$ D)None

65. If three G.M's are inserted in between 1 and 16 then their product is [ ]

A)2 B)8 C)16 D)64

66. Common ratio of the G.P $1-\frac{1}{2}+\frac{1}{4}-\frac{1}{8}+.....$ = [ ]

A) $-\frac{1}{2}$ B) $\frac{1}{2}$ C) 1 D)None

67. The first term of a G.P is 2 and the sum to infinity is 6, then the common ratio = [ ]

A) 1 B)2 C) $\frac{2}{3}$ D) $\frac{1}{3}$

68. If $\frac{-2}{7}$, x, $\frac{-7}{2}$ are in G.P then x = [ ]

A) 0 B) 1 C) $\pm 1$ D)None

69. The G.M of 5 and 125 is [ ]

A)24 B)25 C)20 D)None

70. The G.M of 5 and 20 is [ ]

A)50 B) 10 C) 5 D)1

71. The relation between A.M., G.M and H.M. is G = [ ]

A) $\sqrt{AH}$ B) AH C) $(AH)^2$ D) None

72. In G.P, first term a, common ratio r = 1. Then the sum of n terms = [ ]

A) n B)a C) $\frac{ar}{n}$ D) na

**KEY - PROGRESSIONS**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) B | 2) C | 3) B | 4) C | 5) C | 6) C | 7) B | 8) C |
| 9) B | 10) B | 11) B | 12) B | 13) C | 14) B | 15) B | 16) C |
| 17) B | 18) B | 19) B | 20) A | 21) D | 22) C | 23) D | 24) C |
| 25) B | 26) B | 27) D | 28) C | 29) B | 30) A | 31) C | 32) A |
| 33) D | 34) B | 35) C | 36) C | 37) B | 38) D | 39) D | 40) C |
| 41) A | 42) A | 43) B | 44) C | 45) C | 46) D | 47) C | 48) D |
| 49) B | 50) C | 51) B | 52) C | 53) A | 54) C | 55) C | 56) A |
| 57) D | 58) C | 59) A | 60) C | 61) D | 62) A | 63) C | 64) B |
| 65) D | 66) A | 67) D | 68) C | 69) B | 70) B | 71) A | 72) D |

## GEOMETRY

1. Triangle with measurements 10, 8 and 6 units is [ ]
   A) Obtuse-angled $\Delta$ B) Right angled $\Delta$
   C) Acute angled $\Delta$ D) None of the above
2. $\Delta$ ABC $\sqcup$ $\Delta$DEF. $\angle A = 50^0$, then $\angle E + \angle F =$ [ ]
   A) $130^0$ B) $40^0$ C) $80^0$ D) $140^0$
3. Altitudes of two similar triangles are in 1 : $\sqrt{2}$ ratio, then the ratio of their areas : [ ]
   A) 1 : 2 B) 2 : 1 C) 1 : $\sqrt{2}$ D) $\sqrt{2}$ : 1
4. The length of a tangent drawn from a point "P", 5 cms. away from the centre of the circle of radius 3cm. is : [ ]
   A) 3cms B) 4 cms C) 5 cms D) 8 cms
5. $\Delta$ABC $\sqcup$ $\Delta$ PQR. If AB = 3.6, PQ = 2.4 and PR = 5.4 ; AC = [ ]
   A) 3.6 B) 8.1 C) 5.4 D) 7.8
6. The area of a rectangle is 24 sq. cms. If its length is 6cms ; then its perimeter is [ ]
   A) 25cm B) 24 cm C) 20 cm D) 26 cm
7. In a triangle XYZ, if the internal bisector of $\angle X$ meets YZ in P, then [ ]
   A) $\frac{XY}{XZ} = \frac{YP}{PZ}$ B) $\frac{XY}{PZ} = \frac{XZ}{YP}$ C) $\frac{XY}{XZ} = \frac{PZ}{XP}$ D) $\frac{XZ}{YP} = \frac{YP}{YZ}$
8. The angle subtended by major arc at the centre is [ ]
   A) $>180^0$ B) $<180^0$ C) $180^0$ D) $90^0$
9. If $\Delta$ABC $\sqcup$ $\Delta$PQR, then AB : PQ = [ ]
   A) QR : BC B) AC : PR C) PR : AC D) BC : PR
10. If two circles touch internally, then the number of their common tangents: [ ]
    A) 1 B) 2 C) 3 D) None
11. Which of the following are similar? [ ]
    A) All right angled triangles B) All rectangles
    C) All squares D) All the regular polygons
12. The bisector of the exterior $\angle A$ of the triangle ABC intersects the side BC produced in D, then [ ]
    A) $\frac{AB}{AC} = \frac{BD}{CD}$ B) $\frac{BC}{AD} = \frac{AC}{BD}$ C) $\frac{AC}{AB} = \frac{BD}{CD}$ D) $\frac{AD}{BC} = \frac{AC}{BD}$
13. If $\Delta$ ABC$\sqcup$ $\Delta$PQR, $\frac{AB}{PQ}$ = [ ]
    A) $\frac{QR}{BC}$ B) $\frac{AC}{PR}$ C) $\frac{PR}{AC}$ D) $\frac{BC}{PR}$
14. A parallelogram inscribed in a circle is [ ]
    A) Rectangle B) Rhombus C) Square D) None of these
15. In $\Delta$ABC, $BC^2 = AB^2 + AC^2$, then ..... is a right angle. [ ]
    A) $\angle A$ B) $\angle B$ C) $\angle C$ D) None

## GEOMETRY

16. The vertical angle bisector of $\angle X$ of the $\Delta$ XYZ intersects the side YZ at P. Then [ ]

A) $\frac{XY}{XZ}=\frac{YP}{PZ}$ B) $\frac{XY}{PZ}=\frac{XZ}{YP}$ C) $\frac{XY}{XZ}=\frac{PZ}{XP}$ D) $\frac{XZ}{XY}=\frac{YP}{YZ}$

17. If ABCD is a cyclic quadrilateral with $\angle C=120^0$, then $\angle A=$ [ ]

A) $40^0$ B) $50^0$ C) $60^0$ D) $70^0$

18. If a parallelogram is cyclic, then it is [ ]

A) Rhombus B) Rectangle C) Trapezium D) Square

19. The angle in the major segment of a circle is [ ]

A) Acute B) Right angle C) Obtuse D) Reflexive

20. The circumference of two similar triangles are in the ratio 1 : 3 then the ratio of their corresponding sides are [ ]

A) 1 : 1 B) 1 : 2 C) 1 : 3 D) 3 : 1

21. $\Delta ABC \sqcup \Delta PQR$; $\angle A=50^0$, $\angle B=60^0$, then $\angle R=$ [ ]

A) $50^0$ B) $60^0$ C) $70^0$ D) $80^0$

22. $\Delta ABC \sqcup \Delta DEF$ ; m$\angle A$+m $\angle B$=$130^0$, then $\angle D$ = [ ]

A) $130^0$ B) $140^0$ C) $50^0$ D) $40^0$

23. In a $\Delta ABC$, the internal bisector of $\angle A$ intersects BC at D ; BD : DC = 4 : 7 and AC = 3.5 cm. The measurement of AB in cms. [ ]

A) 7 B) 4 C) 2 D) 8

24. In a $\Delta ABC$, if a circle drawn on $\overline{BC}$ as diameter passes through A ; then $\Delta$ ABC is [ ]

A) An obtuse angled triangle B) An acute angled triangle

C) An equilateral triangle D) A right angled triangle

25. The diagonal of a square is _____ times to its side [ ]

A) $\sqrt{3}$ B) $\sqrt{5}$ C) $\sqrt{2}$ D) $\sqrt{6}$

26. If two circles touch externally, then the number of common tangents is [ ]

A) 1 B) 6 C) 3 D) 2

27. If two circles of radii 3cm, 5cm touch each other internally, then the distance between their centres is (in cms) [ ]

A) 8 B) 2 C) 35 D) 15

28. If $\Delta ABC \sqcup \Delta PQR$ ; $\overline{AB} : \overline{AC}$ = [ ]

A) PR : PQ B) PQ : PR C) PQ : QR D) QR : PR

29. $\Delta ABC \sqcup \Delta PQR$ ; AB = 3.6 cm; PQ=2.4 cm ; AC = 8.1 cm, then PR = [ ]

A) 3.6 cm B) 5.4 cm C) 7.8 cm D) 7.3 cm

30. If the ratio of the two similar triangles are 1 : 2, then the ratio of their altitudes [ ]

A) 2 : 1 B) 1 : 2 C) 1 : $\sqrt{2}$ D) 1 : 4

31. Two circles of radii 8cm and 5cm touch externally, then the distance between their centre is [ ]

A) 8cm B) 13cm C) 5 cm D) 3cm

32. Locus of centre of circles which touch a given line at a given point is ____ [ ]

A) Parallel B) Perpendicular C) Makes $< 60^0$ D) Makes $<450^0$

33. If $\Delta ABC \sqcup \Delta DEF$ and $\angle A + \angle B = 130^0$, *then* $\angle F =$ [ ]

A) $140^0$ B) $50^0$ C) $60^0$ D) $40^0$

## KEY - GEOMETRY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) B | 2) A | 3) A | 4) B | 5) B | 6) C | 7) A | 8) A |
| 9) B | 10) A | 11) C | 12) A | 13) B | 14) A | 15) A | 16) A |
| 17) C | 18) B | 19) A | 20) C | 21) C | 22) C | 23) C | 24) D |
| 25) C | 26) C | 27) B | 28) B | 29) B | 30) C | 31) D | 32) B |
| 33) B | | | | | | | |

## ANLYTICAL GEOMETRY

1. Equation of the line passing through the point (4, 3) and parallel to 3x+4y=12 is [ ]

A) 3x+4y+24=0 B) 3x+4y-24=0

C) 3x-4y-24=0 D) –3x+4y-24=0

2. Y-intercept made by the line 3x+4y=0 [ ]

A) 0 B) 3 C) 4 D) 7

3. Co-ordinates of the point R that divides the line joining P (3, 2) and Q (6, -1) internally in the ratio 1 : 2 [ ]

A) (4,1) B) (1,4) C) (2,4) D) (4,2)

4. Slope of the line which a perpendicular to the line 5x-2y+4=0 is [ ]

A) $\frac{2}{5}$ B) $-\frac{2}{5}$ C) 2 D) $\frac{5}{2}$

5. The point of intersection of lines y=2x+1 and y=3x-2 is [ ]

A) (3,7) B) (5,13) C) (4,10) D) (2,5)

6. Find the mid point of $(\sin^2\alpha, \sec^2\alpha)$ and $(\cos^2\alpha - \tan^2\alpha)$ [ ]

A) (1,-1) B) (-1, 1) C) (1,1) D) $\left(\frac{1}{2}, \frac{1}{2}\right)$

7. The slope of the line joining the points (-a, a) and (0, a + a $\sqrt{3}$) is [ ]

A) $\sqrt{3}$ B) $\frac{1}{\sqrt{3}}$ C) 2a D) 0

8. The slope of the straight line joining the points (3, -1), (5, 3) is [ ]

A) 1 B) –1 C) 2 D) $\frac{1}{2}$

9. The straight line parallel to 2x-3y+8=0 is [ ]

A) 3x-2y+8=0 B) 3x-2y+6=0 C) 2x-3y+4=0 D) 2x+3y+8=0

10. The centroid of the triangle whose sides are given by x=0, y=0 and x+y=6 is [ ]

A) (0, 0) B) (2, 2) C) (3, 3) D) (6, 6)

11. Distance between the points (a $\cos\theta$, 0) (0, a sin $\theta$) [ ]

A) a B) $\sqrt{a}$ C) $a^2$ D) 0

12. The line x=my+c, cuts the y-axis at [ ]

A) $\left(0,\frac{c}{m}\right)$ B) $\left(0,-\frac{c}{m}\right)$ C) $\left(\frac{m}{c},0\right)$ D) $\left(-\frac{m}{c},0\right)$

13. The line 3x+4y=0 intersects y – axis at [ ]

A) (0,3) B) (0,4) C) (0,0) D) (3,4)

14. The slope of an line making an angle $45^0$ with the positive direction of x-axis is [ ]

A) 1 B) 2 C) 3 D) $\sqrt{3}$

15. Slope of the line perpendicular to 3x+4y=10 [ ]

A) $\frac{3}{4}$ B) $-\frac{3}{4}$ C) $\frac{4}{3}$ D) $-\frac{4}{3}$

16. Point on the Y-axis is [ ]

A) (0,2) B) (2,0) C) (2,2) D) (2,-2)

17. If ax+by+c=0 represents a straight line, then [ ]

A) $|a|=|b|$ B) $|a|+|b|=0$ C) $|a|+|b|\neq 0$ D) $|a|<|b|$

18. Mathematician who has introduced analytical geometry. [ ]

A) J.J Silvester B) Cramer C) Rene Dascarts D) Newton

19. The slop of the line [4, 6] and [2, -5] is [ ]

A) $\frac{6}{5}$ B) $-\frac{2}{4}$ C) $\frac{5}{6}$ D) $\frac{11}{2}$

20. The slope of the line parallel to 3x-2y+1=0 is [ ]

A) $\frac{3}{2}$ B) $\frac{2}{3}$ C) 3 D) $-\frac{2}{3}$

21. If two lines intersect at right angle, then the product of their slopes is [ ]

A) 0 B) 1 C) –1 D) $\infty$

22. The slope of the line perpendicular to the line 3x+4y=10 is [ ]

A) $\frac{3}{4}$ B) $-\frac{3}{4}$ C) $\frac{4}{3}$ D) $-\frac{4}{3}$

23. A is a point on a circle with centre ‘C’. xy is a tangent at ‘A’ and its slope of xy is 2. Then the slope of AC = [ ]

A) 2 B) –2 C) $\frac{1}{2}$ D) $-\frac{1}{2}$

24. y=mx line is known as _____ from [ ]

A) Slope B) Slope-intercept C) Point slope D) Two points

25. The equation of the line which goes to the point (1, 1) having the slope 1 is [ ]

A) x-y=0 B) x-y=1 C) x-y+1=0 D) x-2y-1=0

26. x-intercept made by the line 4x+78=12 is [ ]

A) $\frac{1}{3}$ B) 3 C) $\frac{26}{4}$ D) $\frac{4}{26}$

27. y-intercept made by the line 3x+4y=0 [ ]

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 3 D) 2

28. The straight line parallel to 2x-3y+12=0 is [ ]

A) 4x-9y+20=0 B) 4x+9y+12=0 C) 2x-3y-12=0 D) x-3y+6=0

29. Find the sum of the intercepts made by 3x+4y=12 on the axis [ ]

A) 4 B) 7 C) 3 D) 12

## KEY - ANLYTICAL GEOMETRY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) B | 2) A | 3) A | 4) D | 5) A | 6) D | 7) A | 8) C |
| 9) C | 10) B | 11) A | 12) B | 13) C | 14) A | 15) C | 16) A |
| 17) C | 18) C | 19) D | 20) A | 21) C | 22) C | 23) D | 24) A |
| 25) A | 26) B | 27) D | 28) C | 29) B | | | |

## TRIGONOMETRY

1. If 8 $\tan\theta$=15, then $\cot\theta$ = [ ]

A) $\frac{8}{15}$ B) $\frac{15}{8}$ C) $\frac{8}{17}$ D) $\frac{15}{17}$

2. A sexagesimal measure of $72^0$ is equal in circular measure to [ ]

A) $\pi/5$ B) $2\pi/5$ C) $\pi$ D) $2\pi/3$

3. If $\tan\theta$ is not defined then $\theta$ = [ ]

A) $0^0$ B) $45^0$ C) $60^0$ D) $90^0$

4. If x=sec $\theta$+tan $\theta$ ; y=sec $\theta$-tan $\theta$, eliminate $\theta$ [ ]

A) $x^2 - y^2 = 1$ B) x – y = 1 C) x + y = 1 D) xy=1

5. Tan(90+ $\theta$)= [ ]

A) tan $\theta$ B) sin $\theta$ C)-tan $\theta$ D) –cot $\theta$

6. If the terminal side completes one revolution about its vertex, the angle made is ; [ ]

A) $360^0$ B) $270^0$ C) $180^0$ D) $90^0$

7. A minute hand of a table clock is 3cm. long. How far is its tip moves in 20 minutes? [ ]

A) 3cm B) 9cm C) $\frac{22}{7}$cm D) $\frac{44}{7}$cm

8. If $\text{Cos}0^0 + \sqrt{2}\ \text{Sin}\ 45^0 + \text{Sin A} = 3$, then A = [ ]

A) $90^0$ B) $30^0$ C) $45^0$ D) $60^0$

9. If x = a sec $\theta$ ; y = a tan $\theta$ then $x^2 - y^2$ = [ ]

A) $a^2$ B) a C) 0 D) 1

10. If $(\sec\theta + \tan\theta) = m$, the value of $(\sec\theta - \tan\theta)$ = [ ]

A) $-m$ B) $\frac{m}{2}$ C) $\frac{1}{m}$ D) $m+1$

11. If $\tan(A+B) = \sqrt{3}$, $\tan A = 1$ $\tan \angle B$ = [ ]

A) $15^0$ B) $30^0$ C) $60^0$ D) $45^0$

12. If a wheel makes $360^0$ revolution in one minute then through how many radians does is turn in one second? [ ]

A) $12\pi$ B) $9\pi$ C) $36\pi$ D) $6\pi$

13. The value of $\sin\theta$ in terms of $\sec\theta$ [ ]

A) $\frac{\sqrt{Sec^2\theta - 1}}{Sec\theta}$ B) $\sqrt{Sec^2\theta - 1}$ C) $\frac{1}{\sqrt{Sec^2\theta - 1}}$ D) $\frac{1}{Sec\theta}$

14. If $\text{Sin } 30^0 = \frac{1}{2}$, then $\cos 60^0$ = [ ]

A) $\sqrt{2}$ B) $\sqrt{3}$ C) $\frac{1}{2}$ D) $\frac{\sqrt{3}}{2}$

15. If $\text{Sec}\,\theta + \tan\theta = 4$, then $\sec\theta - \tan\theta$ = [ ]

A) 4 B) 3 C) $\frac{1}{4}$ D) 16

16. $\tan^2 50^0 - \sec^2 50^0$ = [ ]

A) $-1$ B) 1 C) $\sqrt{2}$ D) $\sqrt{3}$

17. $45^0$ = _____ radians. [ ]

A) $\frac{\pi}{6}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{2}$

18. A straight angle contains [ ]

A) $90^0$ B) $135^0$ C) $180^0$ D) $225^0$

19. Cos 2A = [ ]

A) 2 sin A cos A B) $\text{Cos}^2$ A – $\text{Sin}^2$A

C) CosA Cos B – Sin A SinB D) SinA Cos B + Cos A Sin B

20. Which one of the following is not an identity [ ]

A) $\text{Sin}^2\theta + \text{Cos}^2\theta = 1$ B) $\text{Cosec}^2\theta - \text{Cot}^2\theta = 1$

C) $\text{Sec}^2\theta - \tan^2\theta = 1$ D) $\text{Sec}^2\theta + \tan^2\theta = 1$

21. $\text{Sin}^2\theta + \text{Sin}^2 81$ = ____ [ ]

A) 1 B) 0 C) $\frac{1}{2}$ D) $\frac{\sqrt{3}}{2}$

22. If $\sin\theta = \frac{3}{5}$; $\theta$ is acute, then $\cos\theta$ = [ ]

A) $\frac{4}{5}$ B) $\frac{3}{4}$ C) $\frac{2}{3}$ D) $\frac{1}{2}$

23. If $\cot\theta = \frac{3}{4}$; $\theta$ is acute then $\operatorname{cosec}\theta$ = [ ]

A) $\frac{-5}{4}$ B) $\frac{-4}{5}$ C) $\frac{4}{5}$ D) $\frac{5}{4}$

24. If $\sin(90-\theta)$ = then $\theta$ = [ ]

A) $0^0$ B) $45^0$ C) $60^0$ D) $90^0$

25. $\operatorname{Sec}(90-\theta)$ = [ ]

A) $\operatorname{Cos}\theta$ B) $\operatorname{Sin}\theta$ C) $\operatorname{Cosec}\theta$ D) $\operatorname{Cot}\theta$

26. $\operatorname{Cosec}(270^0+\theta)$ = _____ [ ]

A) $-\sec\theta$ B) $\operatorname{Sec}\theta$ C) $\operatorname{Cosec}\theta$ D) $-\operatorname{Cosec}\theta$

27. If $\operatorname{Sin}\theta = \operatorname{Cos}2\theta$ then $\cot 3\theta$ = [ ]

A) $\sqrt{3}$ B) $\frac{1}{\sqrt{3}}$ C) 0 D) $\infty$

**28.** The value of $\operatorname{Sec}^2 45^0 - \tan^2 45^0$ [ ]

A) 0 B) 1 C) 2 D) not defined

29. If $A = 15^0$, then Sin6A [ ]

A) 1 B) ½ C) $\sqrt{3}/2$ D) $\frac{1}{\sqrt{2}}$

30. The value of $\operatorname{Sin}^2 30^0 + \operatorname{Cos}^2 60^0$ is [ ]

A) $\frac{1}{4}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{1}{2}$ D) None

31. $\operatorname{Sin}(180+\theta)$ = _____ [ ]

A) $Sin\theta$ B) $Cos\theta$ C) $-Sin\theta$ D) $-Cos\theta$

32. $Co\operatorname{sec}(360+\theta)$ [ ]

A) $\operatorname{Cosec}\theta$ B) $\operatorname{Sec}\theta$ C) $-\operatorname{Cosec}\theta$ D) $-\operatorname{Sec}\theta$

33. The value of $\operatorname{Cosec}^2 30^0 - \operatorname{Cot}^2 30^0$ is _____ [ ]

A) 2 B) 1 C) 0 D) None

34. $\operatorname{Cot}420^0$ [ ]

A) $\sqrt{3}$ B) $1/\sqrt{3}$ C) $-\sqrt{3}$ D) $-1/\sqrt{3}$

35. $\tan(-480^0)$ [ ]

A) $\sqrt{3}$ B) $1/\sqrt{3}$ C) $-\sqrt{3}$ D) $-1/\sqrt{3}$

36. If Sin A = ½ $\left(0 \le A \le \frac{\pi}{2}\right)$, *then* $A =$ [ ]

A) $\frac{\pi}{3}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{6}$ D) $\frac{7\pi}{6}$

37. The value of $Sin^2 30^0 + Cos^2 60^0 + \tan^2 45^0$ is ____ [ ]

A) ½ B) 3/2 C) 1 D) 0

38. If $\sin\theta = \frac{12}{13}$, then $\cos\theta$ = ____ [ ]

A) 5/13 B) 13/5 C) $\frac{\sqrt{313}}{13}$ D) –5/13

39. If $\sec\theta + \tan\theta = P$, then $\sec\theta - \tan\theta$ [ ]

A) P B) 0 C) 1 D) 1/P

40. If $\tan\theta + \cot\theta = 2$, then $\tan^2\theta + \cot^2\theta$ = _____ [ ]

A) 4 B) 2 C) 0 D) 1

41. $\cot(270^0 + \theta)$ [ ]

A) $\cot\theta$ B) $-\cot\theta$ C) $\tan\theta$ D) $-\tan\theta$

42. $Cot^3\frac{\pi}{6}$ = _____ [ ]

A) $\sqrt{3}$ B) 3 C) $3\sqrt{3}$ D) $24\sqrt{3}$

43. $\sin 90^0 + \cos 0^0 + \tan 45^0 + \cot 45^0$ = ____ [ ]

A) 0 B) 1 C) 2 D) 4

44. If $\alpha + \beta = 90^0$ and $\alpha = 2\beta$, then $\cos^2\alpha + Sin^2\beta$ = ___ [ ]

A) 1 B) 0 C) ½ D) 2

45. If $\sqrt{3}\tan\theta = 1$, *then* $\theta$ = _____ [ ]

A) $30^0$ B) $45^0$ C) $60^0$ D) $90^0$

46. If A is acute and tan A = $\sqrt{3}$, then Sin A = _____ [ ]

A) ½ B) 1 C) $\frac{\sqrt{3}}{2}$ D) 0

47. If $\sin\theta = \frac{a}{b}$, $\cos\theta = \frac{c}{d}$ then $\tan\theta$ = _____ [ ]

A) $\frac{bc}{ad}$ B) $\frac{ac}{bd}$ C) $\frac{ab}{cd}$ D) $\frac{ad}{bc}$

48. $\frac{Sin\theta}{\sqrt{1 - Sin^2\theta}}$ = _____ [ ]

A) $\tan\theta$ B) $\operatorname{cosec}\theta$ C) $\cot\theta$ D) $\sec\theta$

49. $\frac{\tan\theta}{\sqrt{1+\tan^2\theta}}$ = _____ [ ]

A) $\frac{\tan\theta}{1+\tan\theta}$ B) $\frac{1}{\tan\theta}$ C) $\cot\theta$ D) $\sin\theta$

50. The value of $\cos60^0\cos30^0 - \sin60^0\sin30^0$ is ____ [ ]

A) 1 B) 0 C) ¼ D) ½

51. The value of $\cos0^0 + \sin90^0 + \sqrt{3}\,cosec60^0$ is ____ [ ]

A) 2 B) 3 C) 4 D) 1

52. $1-\text{Cosec}^2\theta$ =..... [ ]

A) $\text{Cot}^2\theta$ B) $\text{Sec}^2\theta$ C) $-\text{Sec}^2\theta$ D) $-\text{Cot}^2\theta$

## KEY - TRIGONOMETRY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) A | 2) D | 3) D | 4) D | 5) D | 6) A | 7) D | 8) A |
| 9) A | 10) C | 11) A | 12) A | 13) A | 14) C | 15) C | 16) A |
| 17) B | 18) C | 19) B | 20) D | 21) A | 22) A | 23) C | 24) B |
| 25) C | 26) A | 27) C | 28) B | 29) A | 30) C | 31) C | 32) A |
| 33) B | 34) B | 35) A | 36) C | 37) B | 38) A | 39) D | 40) B |
| 41) D | 42) C | 43) D | 44) C | 45) A | 46) C | 47) D | 48) A |
| 49) D | 50) B | 51) C | 52) A | | | | |

## STATISTICS

1. The mean of 10 a distribution are 29 and 32 respectively. Then the mean of all the observations is. [ ]

   A) 7 B) 12 C) 10 D) 15

2. The mode and mean of a distrubution are 29 and 32 respectively. Then the median of the distribution is: [ ]

   A) 29.5 B) 30 C) 30.5 D) 31

3. The A.M. of a+2,a,a-2is [ ]

   A) a+2 B) 30 C) a-2 D) 3a

4. In the frequency distribution with class intervals, 1-10,11-20... ..., the upper boundary of class 1-10 is [ ]

   A) 9.5 B) 10.5 C) 10 D) 11

5. Range of the scores 20,18,37,42,3,12,15,26 is: [ ]

   A) 45 B) 34 C) 39 D) 40

6. Formula to find arithmetic mean by deviation method: [ ]

   A) $L+\frac{\frac{N}{2}-M}{f}XC$ B) $\frac{\sum f_i x_i}{N}$ C) $A+\frac{\sum f_i d_i}{N}XC$ D) $L+\frac{\Delta_1}{\Delta_1+\Delta_2}XC$

7. The class interval of the frequency distribution having the classes 1-8,9-16,17-24....[ ]

A) 8 B)9 C) 7 D) 3

8. The mean of 2,3,4 and x is 4. The value of x is [ ]

A) 4 B) 7 `C) 6 D) 5

9. The median of $\frac{3}{4},\frac{1}{2},\frac{2}{3},\frac{1}{6},\frac{7}{12}$ is [ ]

A) $\frac{1}{6}$ B) $\frac{2}{3}$ C) $\frac{7}{12}$ D) $\frac{3}{4}$

10. If arithmetic mean is 32, median is 29 of a data, then mode is: [ ]

A) 29.5 B) 30 C) 30.5 D) 31

11. ... ... is used in calculating arithmetic mean [ ]

A) Greater than cumulative frequency

B) Less than cumulative frequency

C) Mid values D) None

12. The mid value of the class 40-50 is [ ]

A) 40 B) 45 C) 50 D) 90

13. A Histogram consists of [ ]

A)Sectors B) Rectangles C) Triangles D) Squares

14. Mid values of the class intervals are used in the calculation of [ ]

A) Arithmetic mean B) Mode

C) Median D) None of the three

15. The formula for the mean of the ungrouped data is [ ]

A) $\sum nx$ B) $\frac{\sum x}{n}$ C) $\frac{\sum x}{n^2}$ D) $\sum n^2 x$

16. The mid value of the class is used to calculate for [ ]

A) Arithmetic mean B) Mode C) Median D) None

17. The mean of the scores 12, 15, x, 19, 25, 44 is 25. Then x = [ ]

A) 20 B) 25 C) 30 D) 35

18. The median of the scores 13, 23, 12, 18, 26, 19, 14 is [ ]

A) 14 B) 26 C) 13 D) 18

19. The median of the scores 10, 30, 110, 102, 90 and 50 is [ ]

A) 90 B) 110 C) 70 D) 150

20. The median of $\frac{x}{3}, \frac{x}{2}, \frac{x}{4}, \frac{2x}{9}$, $x\ (x>0)$ *is* 5. *Then* $x$ = [ ]

A) 10 B) 20 C) 15 D) 25

21. Formula for grouped data of median [ ]

A) $L+\left(\frac{\frac{N}{2}-F}{f}\right)$ B) $\frac{L+\frac{N}{2}-C}{F}$ C) $L+\left(\frac{\frac{N}{2}-f}{F}\right)C$ D) None of these

22. The relation among mean, median and mode is [ ]

A) Mean = 3 Mode – 2 Median B) Median = 3 Mean – 2 Mode

C) Mode = 3 Mean – 2 Median D) Mode = 3 Median – 2 Mean

23. The mean of the data is 39. Median is 38 then Mode = [ ]

A) 39 B) 38 C) 36 D) None of these

24. The mean = 39, Median = 37.5 then its mode value is [ ]

A) 34.8 B) 34.5 C) 38.5 D) 36.8

25. The Mean is 39 and mode is 34.5 then its median is [ ]

A) 34.8 B) 37.5 C) 38.5 D) 36.8

26. The range of the scores 10, 18, 15, 12, 13, 15 and 16 is [ ]

A) 15 B) 8 C) 12 D) 13

## KEY - STATISTICS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) D | 2) D | 3) D | 4) C | 5) C | 6) A | 7) D | 8) C |
| 9) D | 10) C | 11) B | 12) B | 13) A | 14) B | 15) A | 16) D |
| 17) D | 18) C | 19) C | 20) D | 21) D | 22) C | 23) B | 24) B |
| 25) B | | | | | | | |

## MATRICES

1. Identity matrix is : [ ]

A) $\begin{bmatrix}1 & 1\\ 1 & 1\end{bmatrix}$ B) $\begin{bmatrix}0 & 1\\ 1 & 0\end{bmatrix}$ C) $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ D) $\begin{bmatrix}0 & 0\\ 1 & 1\end{bmatrix}$

2. If $\begin{bmatrix}1 & 2\\ 3 & x\end{bmatrix} = -2$, *then* $x =$ [ ]

A) 1 B) 2 C) 3 D) 4

3. If A $A = \begin{bmatrix}1 & 4\\ 0 & -1\end{bmatrix}$ *then* $A^{-1} =$ [ ]

A) – A B) $A^2$ C) A D) 2A

4. If $\begin{bmatrix}x & 6\\ 3 & 2x\end{bmatrix}$ is a singular matrix, then $x =$ [ ]

A) 1 B) 2 C) 3 D) 4

5. If $A = [5 \quad 2]$; $B = \begin{bmatrix}x\\ y\end{bmatrix}$ *then* $A.B$ = [ ]

A) $[5x \quad 2y]$ B) $[5x \quad +2y,]$ C) $\begin{bmatrix}5x\\ 2y\end{bmatrix}$ D) $[5+y \quad 2+y]$

6. Which of the following is an identify matrix ? [ ]

A) $\begin{bmatrix}1 & 1\\ 1 & 1\end{bmatrix}$ B) $\begin{bmatrix}0 & 1\\ 1 & 0\end{bmatrix}$ C) $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ D) $\begin{bmatrix}1 & 0\\ 0 & 0\end{bmatrix}$

7. A. $A=\begin{bmatrix}3 & 4\\ 6 & x\end{bmatrix}$; $B=\begin{bmatrix}3 & 4\\ p & 2\end{bmatrix}$ and A = B, then $p$ *and* $x$ *are* [ ]

A) $p=6; x=2$ B) $p=2; x=6$ C) $p=3; x=4$ D) $p=4; x=3$

8. A . $A^{-1}$ = [ ]

A) Null matrix B) Identify matrix C) A D) $A^{-1}$

9. $A=\begin{bmatrix}1 & 2 & 0\\ 3 & 4 & 5\end{bmatrix}$; $B=\begin{bmatrix}2 & 3 & 4\\ 1 & 2 & 0\end{bmatrix}$, *what is AB*? [ ]

A) $\begin{bmatrix}1 & 2 & 0\\ 3 & 4 & 5\end{bmatrix}$ B) Multiplication C) $\begin{bmatrix}2 & 6 & 4\\ 3 & 8 & 5\end{bmatrix}$ D) $\begin{bmatrix}2 & 3\\ 6 & 8\\ 8 & 0\end{bmatrix}$

10. Determinant of $\begin{bmatrix}3 & -1\\ 1 & 2\end{bmatrix}$ *is* [ ]

A) 7 B) 6 C) 4 D) 6

11. If $\begin{bmatrix}1 & -4\\ d & 5\end{bmatrix}$ = 14, then d = [ ]

A) – 1 B) 1 C) 2 D) 4

12. If $\begin{bmatrix}x & 5\\ 5 & x\end{bmatrix}$ has no multiplicative inverse, then $x=$ [ ]

A) 5 B) 6 C) 25 D) 10

13. If $A=\begin{bmatrix}4 & 5\\ 2 & 3\end{bmatrix}$; $B=\begin{bmatrix}2 & 3\\ 4 & 5\end{bmatrix}$, then A.B = [ ]

A) $\begin{bmatrix}4 & 5\\ 2 & 3\end{bmatrix}$ B) $\begin{bmatrix}2 & 3\\ 4 & 5\end{bmatrix}$ C) $\begin{bmatrix}2 & 4\\ 3 & 5\end{bmatrix}$ D) $\begin{bmatrix}3 & 2\\ 5 & 4\end{bmatrix}$

14. If $\begin{pmatrix}a & 3\\ 1 & 2\end{pmatrix}\begin{pmatrix}2\\ -1\end{pmatrix}=\begin{pmatrix}5\\ 0\end{pmatrix}$, then $\alpha$ = [ ]

A) 1 B) 2 C) 3 D) 4

15. If $A=\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$ and $B=\begin{pmatrix}1 & 2\\ 3 & 4\end{pmatrix}$ then A.B = [ ]

A) $\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$ B) $\begin{pmatrix}1 & 2\\ 3 & 4\end{pmatrix}$ C) $\begin{pmatrix}1 & 3\\ 2 & 4\end{pmatrix}$ D) $\begin{pmatrix}-1 & -2\\ -3 & -4\end{pmatrix}$

16. Rows and columns of the matrix A are interchanged then the new matrix is known as matrix [ ]

A) Inverse B) Square C) Transpose D) Zero

17. Of the following the scalar matrix is [ ]

A) $\begin{pmatrix}1 & 2\\ 3 & 1\end{pmatrix}$ B) $\begin{pmatrix}2 & 0\\ 0 & 2\end{pmatrix}$ C) $\begin{pmatrix}0 & 2\\ 2 & 0\end{pmatrix}$ D) $\begin{pmatrix}1 & 0\\ 0 & -4\end{pmatrix}$

18. If $P=\begin{pmatrix}3 & 0\\ 0 & -\lambda\end{pmatrix}$ is a scalar matrix, then $\lambda$ = [ ]

A) 0 B) 1 C) $\frac{1}{3}$ D) 3

19. A = $\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$; $B=\begin{pmatrix}0 & 1\\ 1 & 0\end{pmatrix}$, then AB = [ ]

A) A B) B C) $\begin{pmatrix}0 & 0\\ 0 & 0\end{pmatrix}$ D) $\begin{pmatrix}1 & 1\\ 1 & 1\end{pmatrix}$

20. If $\begin{pmatrix}1 & 3\\ 0 & 1\end{pmatrix}\begin{pmatrix}2\\ -1\end{pmatrix}=\begin{pmatrix}x\\ -1\end{pmatrix}$, *then* $x=$_____ [ ]

A) 1 B) 2 C) 3 D) -1

21. If A = $\begin{pmatrix}Cos\theta & -Sin\theta\\ Sin\theta & Cos\theta\end{pmatrix}$, *then* $|A|$ = [ ]

A) 1 B) 0 C) – 1 D) None

22. If $\begin{vmatrix}1 & 2\\ 3 & 3x\end{vmatrix}=3$, *then* $x$ *value is* [ ]

A) 2 B) 3 C) 4 D) 5

23. A = $\begin{pmatrix}4 & x\\ x & 9\end{pmatrix}$; If it has no multiplicative inverse, then $x$ = [ ]

A) $\pm$ 6 B) $\pm$ 4 C) $\pm$ 9 D) $\pm$ 3

24. While solving the equations, $3x + 4y = 8$ *and* $x-6y=10$ by Cramer's method, the matrix $B_1$ = [ ]

A) $\begin{bmatrix}3 & 4\\ 1 & -6\end{bmatrix}$ B) $\begin{pmatrix}8\\ 10\end{pmatrix}$ C) $\begin{bmatrix}8 & 4\\ 10 & -6\end{bmatrix}$ D) $\begin{bmatrix}3 & 8\\ 1 & 10\end{bmatrix}$

25. If $\begin{bmatrix}1 & 0\\ 3 & 1\end{bmatrix}\begin{pmatrix}2\\ -1\end{pmatrix}=\begin{pmatrix}x\\ 5\end{pmatrix}$, *then* $x=$ [ ]

A) 1 B) 2 C) 3 D) -1

26. If P = $\begin{bmatrix}5 & 0\\ 0 & \lambda\end{bmatrix}$ is to be scalar matrix, then $\lambda$ = [ ]

A) 0 B) 1 C) 2 D) 5

27. The order of the matrices A and B are 3 x 4 and 5 x 3 respectively. Find the order of the product of BA = [ ]

A) 5 x 4 B) 4 x 5 C) 3 x 5 D) 3 x 3

28. If A = $\begin{pmatrix}i & 0\\ 0 & -i\end{pmatrix}$ then $A^2$ = [ ]

A) $\begin{pmatrix}1 & 0\\ 0 & -1\end{pmatrix}$ B) $\begin{pmatrix}-1 & 0\\ 0 & -1\end{pmatrix}$ C) $\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$ D) $\begin{pmatrix}-1 & 0\\ 0 & 1\end{pmatrix}$

29.If $A = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{pmatrix}$, $B = \begin{pmatrix} 1 \\ 0 \\ 5 \end{pmatrix}$, then AB = [ ]

A) [1 0 15] B) [4 0 30] C) $\begin{pmatrix} 16 \\ 34 \end{pmatrix}$ D) [16 34]

30. If $P = \begin{pmatrix} 1 \\ 3 \\ 4 \end{pmatrix}$, Q = [2 -1 5], then PQ = [ ]

A) $\begin{pmatrix} 2 & -1 & 5 \\ 6 & -3 & 15 \\ 8 & -4 & 20 \end{pmatrix}$ B) [2 -3 20] C) $\begin{pmatrix} 2 \\ -3 \\ 20 \end{pmatrix}$ D) [19]

31. If $A = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, then AB + BA = [ ]

A) A B) 2A C) 3A D) 4A

32.If $A = \begin{pmatrix} a & 0 \\ a & 0 \end{pmatrix}$, $B = \begin{pmatrix} 0 & 0 \\ b & b \end{pmatrix}$, then AB = [ ]

A) 0 B) b A C) aB D) ab AB

33.If $A = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$, then $|A|$ = [ ]

A) 1 B)-2 C)1 D) 0

34.If $A = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$, then $A^4$ = [ ]

A) $I$ B) 0 C) A D) 4$I$

35.If $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ *and* $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ *then* $A^2$-(a+d)A – (bc - ad) I = [ ]

A) O B) $I$ C) 2$I$ D) (a – d)

36. $\begin{pmatrix} x & 0 \\ 0 & y \end{pmatrix}\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ = [ ]

A) $\begin{pmatrix} ax & bx \\ yc & dy \end{pmatrix}$ B) $\begin{pmatrix} ax & 0 \\ 0 & dy \end{pmatrix}$ C) $\begin{pmatrix} ay & cy \\ bx & dy \end{pmatrix}$ D) $\begin{pmatrix} 0 & ax \\ dy & 0 \end{pmatrix}$

37.If A and B are two n x n matrices then $(A+B)^2$ = [ ]

A) $A^2+2AB+B^2$ B) $A^2+AB+BA+B^2$ C) $A^2 + B^2$ D) A + B

38.If AB = A and BA = B then

A) A = 2B B) $A^2$ = A and $B^2$ = B C) 2A = B D) Can't be determined

39.If A = [x y], B = $\begin{pmatrix} a & h \\ h & b \end{pmatrix}$, $C = \begin{pmatrix} x \\ y \end{pmatrix}$, then ABC = [ ]

A) (ax+hy+bxy) B) ($ax^2$+2hxy+$by^2$) C) ($ax^2$-2hxy+$by^2$) D) ($bx^2$-2hxy+$ay^2$)

40.If $\begin{pmatrix} x & 1 \\ 1 & y \end{pmatrix} \begin{pmatrix} 1 & 4 \\ 2 & 6 \end{pmatrix} = \begin{pmatrix} 4 & 14 \\ 7 & 22 \end{pmatrix}$, then (x, y) =_____ [ ]

A) (1, -2) B) (2, 1) C) (3, 2) D) (2, 3)

41.If $A = A^T$, then A is called as……matrix

A) Square B) Diagonal C) Scalar D) Symmetric

42. If transpose of a matrix is equal to its additive inverse then it is called [ ]

A) Symmetric B) Skew-symmetric C) Scalar D) Singular

43. A = $\begin{pmatrix} 4 & 6 \\ 6 & 9 \end{pmatrix}$ is a [ ]

A) Symmetric B) Skew symmetric C) Singular D) Non singular

44.If A = $\begin{pmatrix} 1 & -1 \\ 1 & 0 \end{pmatrix}$ *then* $A^T$ = [ ]

A) $\begin{pmatrix} 1 & 1 \\ -1 & 0 \end{pmatrix}$ B) $\begin{pmatrix} 0 & -1 \\ 1 & 1 \end{pmatrix}$ C) $\begin{pmatrix} -1 & 1 \\ 1 & 1 \end{pmatrix}$ D) $\begin{pmatrix} -1 & -1 \\ -1 & 1 \end{pmatrix}$

45.If A = $\begin{pmatrix} 0 & 1 & -2 \\ 1 & 0 & 3 \\ 2 & -3 & 0 \end{pmatrix}$ *then* $A + A^T$ = [ ]

A) $\begin{pmatrix} 0 & 2 & 0 \\ 2 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix}$ B) $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 4 \end{pmatrix}$ C) $\begin{pmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{pmatrix}$ D) $\begin{pmatrix} 2 & 0 & 2 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{pmatrix}$

46.Let A = $\begin{pmatrix} 5 & x \\ y & 0 \end{pmatrix}$ and A = $A^T$, then [ ]

A) x = 0, y = 5 B) x+y = 5 C) x = y D) x = -y

47. $(A^T B^T)^T$ = [ ]

A) AB B) BA C) $A^T B^T$ D) $AB^T$

48. If A = $\begin{pmatrix} a & h & g \\ h & b & f \\ g & f & e \end{pmatrix}$, then A is [ ]

A) Nilpotent B) Involuntary C) a symmetric D) Idempotent

49. A = $\begin{pmatrix} x & -7 \\ 7 & y \end{pmatrix}$ is a skew-symmetric matrix, then (x, y) = [ ]

A) (1, -1) B) (7, -7) C) (0, 0) D) (14, -14)

50. If A, B are symmetric matrices of the same order, then AB - BA is [ ]

A) Symmetric matrix B) Skew symmetric matrix

C) Diagonal matrix D) Identity matrix

51. If $A = \begin{pmatrix} x & 1 & 4 \\ -1 & 0 & 7 \\ -4 & -7 & 0 \end{pmatrix}$ such that $A^T = -A$, then x = [ ]

A) –1 B) 0 C) 1 D) 4

52. The determinant of $\begin{bmatrix} Cos\theta & -Sin\theta \\ Sin\theta & Cos\theta \end{bmatrix}$ *is* [ ]

A) 0 B) – 1 C) 1 D) 2

53. Square root of $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ [ ]

A) $\pm\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$ B) $\pm\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$ C) $\pm\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ D) $\pm\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$

## KEY - MATRICES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) C | 2) D | 3) A | 4) C | 5)B | 6)C | 7)A | 8)B |
| 9)B | 10)A | 11)D | 12)A | 13)D | 14)D | 15)B | 16)C |
| 17)B | 18)D | 19)B | 20)D | 21)A | 22)B | 23)A | 24)C |
| 25)B | 26)D | 27)A | 28)B | 29)C | 30)A | 31)B | 32)A |
| 33)A | 34)A | 35)A | 36)A | 37)B | 38)B | 39)B | 40)D |
| 41)D | 42)B | 43)C | 44)A | 45)A | 46)C | 47)B | 48)C |
| 49)C | 50)A | 51)B | 52)C | 53)A | | | |

## COMPUTING

1. Large scale integrated circuits are used in _____ generation computers : [ ]

A) First B) Second C) Third D) Fourth

2. The unit which belongs to central processing unit [ ]

A) Input unit B) Output unit C) Input cum Output unit D) Control unit

3. In second generation computers _____ were used : [ ]

A) Vacuum tubes B) Transistors

C) Large scale integrated circuits D) Electronic circuits

4. Transistors are used in the Computers of [ ]

A) First Generation B) Second Generation

C) Third Generation D) Fourth Generation

5. A type of box used in flow chart is [ ]

A) Sector B) Rectangle C) Pentagon D) Decagon

6. Input, Output, C.P.U., are _____ of the computer. [ ]

A) Software B) Hardware C) Knowledge D) Language

7. Vacuum tubes are used in _____ generation of computers. [ ]

A) Fourth B) First C) Second D) Third

8. Who is considered as father of computers [ ]

A) Pascal B) Leibnitz C) Babbage D)Turing

9. Present day computers are called [ ]

A) Pascal machines B) Leibnitz machines

C) Babbage machines D) Newmann machines

10. Present day computers are designed by [ ]

A) Pascal B) Babbage C) Newmann D) Turing

11. Which of the following computer language is named after the inventor of the mechanical calculator [ ]

A) BASIC B) ABA C)LOGO D) PASCAL

12. Full form of C.P.U [ ]

A) Control program unit B) Central program unit

C) Computer program unit D)Central processing unit

13. Information is fed to the computer through--------- unit [ ]

A) input device B) control C) ALU D) Monitor

14. All arithmetic operations are performed in ---------of computer. [ ]

A) ALU B)Output unit C) VDU D)Monitor

15. Large amount of information is stored in _ _ _of the computer. [ ]

A) Control unit B) Arithmetic and logic unit

C) Memory unit D) Input unit

16. _ _ _ is the heart and brain of the computer [ ]

A) ALU B) Control unit C) C.P.U D) None

17. All the parts of the computer are controlled by [ ]

A) ALU B) Input unit C) Control unit D) C.P.U

18. _ _are used as electronic components in 1st generation computers [ ]

A) Transistors B) ICs C) Vacuum tubes D) None

19. _ _are used as electronic components in 2nd generation computers [ ]

A) Transistors B) ICs C) Vacuum tubes D) None of these

20. The full form of IC is [ ]

A) International computing B) Internal computing

C) integrated circuit D) integrated computer

21. _ _ generation computers consists very large scale integrated circuits [ ]

A) First B) Second C) Third D) Fourth

22. The language directly understood by a computer is [ ]

A) High level language B) Basic language

C) Machine language D) Pascal language

23. Computer program consists of [ ]

A) instructions B) instructions and data

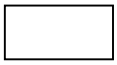
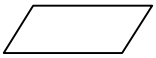
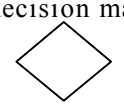
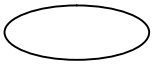
C) data D) low level language

24. Machine language is a [ ]

A) High level language B) Assembly language

C) Low level language D) None of these

25. Which are used in machine language [ ]
A) Binary digits B) English alphabets
C) Hexadecimal digits D) software

26. Which of the following boxes is used to represent decision making [ ]
A)  B)  C)  D) 

27. The machine that could add and subtract was designed by [ ]
A) Leibnitz B) Pascal C) Babbage D) Hollerith

28. A assembler in computer refers to [ ]
A) Program B) language C) hardware D) output

## KEY - COMPUTING

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1) D | 2) D | 3) B | 4) B | 5) B | 6) B | 7) B | 8) C |
| 9) D | 10) C | 11) D | 12) D | 13) A | 14) A | 15) C | 16) C |
| 17) C | 18) C | 19) A | 20) C | 21) D | 22) C | 23) B | 24) C |
| 25) A | 26) C | 27) B | 28) B | | | | |